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Superfund Risk Assessment Information Directory

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The Directory identifies and describes sources of information useful in conducting Superfund-related risk assessments. Information is presented on sources of automated databases, data files and tapes, models, directories, periodicals, publications, and on human and corporate resources. The purpose of the Directory is to facilitate the performance of EPA-related risk assessments by helping individuals find needed information and specialized resources.

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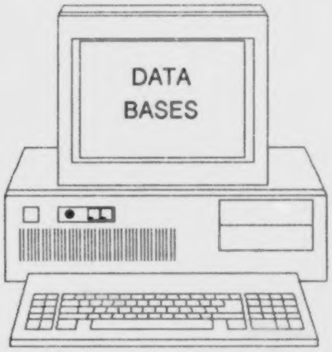
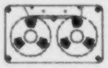
Superfund

EPA

Superfund Risk Assessment Information Directory





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SUPERFUND RISK ASSESSMENT INFORMATION DIRECTORY

Office of Emergency and Remedial Response
Office of Solid Waste and Emergency Response
U.S. Environmental Protection Agency
Washington, D.C. 20460

NOTICE

This **Directory** provides guidance on sources of information that should prove useful in conducting *Superfund* related *risk assessments*. Categories of information sources in the **Directory** include: data bases; data files and tapes; environmental and dose-response models; manuals, directories and periodicals; publications; and human resources.

The **Directory** supplements the *Superfund Public Health Evaluation Manual* and provides a guide to the various *risk assessment* information sources that can supplement the primary information sources, site specific data and professional judgments that are necessary for a successful *Superfund risk assessment*.

EXECUTIVE SUMMARY

The **Superfund Risk Assessment Information Directory** identifies and describes sources of information that should be useful in conducting **EPA**-related *risk assessments*. The **Directory** presents information sources that fall in the following categories: automated data bases; data files and tapes; models; manuals, directories and periodicals; publications; and human resources. Where applicable, the content of individual information sources within each of these categories is summarized and related to the major procedural steps in performing a *risk assesssment* (i.e., hazard identification, dose-response assessment, exposure assessment and risk characterization). Information useful for accessing, obtaining, or locating each of the information sources is also presented. The overall purpose of the **Directory** is to facilitate the performance of **EPA**-related *risk assessments* by helping individuals find information that may be needed in order to complete a successful assessment.

Topics covered by the information sources presented in the **Directory** are broad in scope, including physical and chemical properties of chemical substances; epidemiologic, toxicity and pharmacological data; environmental characteristics; environmental effects of chemical substances; and human health risks caused by exposure to carcinogenic and noncarcinogenic substances. One particular use of the **Risk Assessment Information Directory** will be to identify information sources to assist in performing site-specific public health evaluations under the Comprehensive Environmental Response Compensation and Liability Act. Specifically, this **Directory** will help fill information needs that arise in conducting *risk assessments* as spelled out in the *Superfund Public Health Evaluation Manual*, **EPA's** detailed guidance on how to perform public health evaluations at Superfund sites. Because of its broad scope however, the **Directory** will also be helpful in carrying out other Superfund activities - even those not directly related to *risk assessment*.

The **Risk Assessment Information Directory** has been developed for use by a diverse audience, including **EPA** regional staff, state Superfund program staff, federal and state remedial contractors, and potentially responsible parties. Sufficient background information on the *risk assessment* process and its general information requirements is provided so that the **Directory** can be easily used by individuals with varying degrees of *risk assessment* experience. While the **Directory** identifies information sources that may be used in a *risk assessment*, it does not provide the actual *risk assessment* related information itself. The user of the **Directory** is simply referred to other sources of information and places where those sources can be obtained. Finally, the **Directory** is not intended to reflect **EPA** policy on preferred sources of information to be used in conducting **EPA** related *risk assessments.*

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The efforts of several additional major contributors were instrumental in the development of this **Directory**, including:

James Lounsbury	OERR
Stacey Katz	Office of Policy, Planning, and Evaluation (OPPE)
Steve Golian	OERR
Chuck Nauman	Office of Research and Development (ORD)
Linda Bailey	ORD
Will Laville	ORD
John Koutsandreas	ORD
Steve Hoover	Office of Toxic Substances (OTS)
Dave Mayer	OTS
Paul Fuschini	OTS
Joselle Gatrelle	Office of Information Resources Management (OIRM)
Loretta Marzetti	OIRM
Rick Johnson	OIRM
Peg Hall	Office of Policy, Budget and Program Management
Michael Gruber	Office of Solid Waste
Deborah Martin	OPA
Jack Keeley	Robert S. Kerr Environmental Research Laboratory
Frank Kover	OTS
Susan Deihl	Region IV
Hugh Masters	Edison Environmental Research Laboratory
Arnie Edelman	OTS
Michael Shapiro	OTS
Martin Halper	OTS
Linda Travers	OTS
Laurence Rosenstein	OTS
David Dull	OTS
Peter Preuss	ORD

- Penny Fenner-Crisp Office of Drinking Water
- Edward Klein OTS
- Jay Benforado ORD
- Brint Bixler CH2M Hill
- Bill Lappenbush CH2M Hill
- Louis P. True Office of Pesticide Programs

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CHAPTER 1

INTRODUCTION

1.1 OBJECTIVES

This **Directory** provides guidance on sources of information that should prove useful in conducting **EPA**-related *risk assessments*. Categories of information sources in the **Directory** include: data bases; data files and tapes; environmental and dose-response models; manuals, directories and periodicals; publications; and human resources. The **Directory's** overall approach is to identify information categories related to each major element of *risk assessment*, to list key information sources appropriate for each category, and to describe major features of each information source.

The principal elements of *risk assessment* i.e., hazard identification, dose-response assessment, exposure assessment, and risk characterization, are drawn directly from **EPA's** *risk assessment* guidelines.[1] The guidelines are based in part on recommendations developed by the National Academy of Sciences.[2] Both **EPA** and the National Academy draw important distinctions between *risk assessment* and risk management. *Risk assessment* involves characterizing problems -- their nature, severity and probability of occurrence. By contrast, risk management is the process of deciding what to do about those problems. This **Directory** identifies information sources for assessing risks, not for managing them.

Risk assessment is growing in importance as a tool to aid in decision-making at **EPA**. Virtually every environmental statute the Agency implements can employ *risk assessment* techniques to assist regulatory and response programs. This **Risk Assessment Information Directory** is intended to assist in the broad range of *risk assessments* with which **EPA** may be involved.

Risk assessment activities are important in various parts of *Superfund* related activities, including both the removal and remedial programs. Being able to quantify possible human risks at *Superfund* sites is an important component of the risk management decision making process, when considering removal or remedial actions, to protect populations at risk. The **Risk Assessment Information Directory** could be helpful in quantifying such risks, as well as being useful in evaluating possible adverse environmental effects at *Superfund* sites. In addition, portions of this **Directory** may be helpful to *Superfund* activities not directly related to *risk assessment*. For example, information on physical/chemical properties of hazardous substances could prove useful in identifying appropriate treatment technologies for remedial response alternatives or in performing natural resource damage assessments.

One particular *Superfund*-related use of the **Risk Assessment Information Directory** will be to identify information sources to assist in performing site-specific public health evaluations under the Comprehensive Environmental Response Compensation and Liability Act (**CERCLA**). Public health evaluation is an important component of the *Superfund* remedial process. In particular, the evaluation is important in both the remedial investigation (RI) and feasibility study (FS) phases of cleanup at remedial sites. **EPA** has developed several guidance documents to support the *Superfund* public health evaluation process. Chapter 5 of **EPA's** Guidance on Feasibility Studies Under **CERCLA** describes what the public health evaluation process is. By contrast, the *Superfund Public Health Evaluation Manual* provides detailed guidance on how to conduct the evaluation.

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[1] 51 *Federal Register* 33492-34003 and 51 *Federal Register* 34014-34025.

[2] National Academy of Sciences, *Risk Assessment in the Federal Government*. National Academy Press. 1984.

To supplement these guidance documents, there are two primary information sources for conducting *Superfund* public health evaluations. Appendices to the *Superfund Public Health Evaluation Manual* provide toxicity and physical/chemical properties data for the hazardous substances most likely to be found at *Superfund* sites. These data have been assembled into a personal computer software package named the Public Health Risk Evaluation Data Base (PHRED). A companion document to the public health evaluation manual, the *Superfund Exposure Assessment Manual*, provides detailed information for evaluating: the type and extent of contaminant release from a site to environmental media; the environmental transport and transformation of contaminants following their release; and the concentration of contaminants at human exposure points. This *Manual* provides an overall framework for conducting the exposure assessment portion of a public health evaluation and presents state-of-the art methods for conducting the various component analyses that comprise an exposure assessment.

Although the *Superfund Public Health Evaluation Manual* and its two primary information sources should be sufficient to conduct *risk assessments* at many sites, there will be instances where additional information sources may be necessary to complete the evaluation process. In such instances the **Risk Assessment Information Directory** provides a guide to the various *risk assessment* information sources that can supplement the primary information sources, site-specific data and professional judgment that are necessary for a successful public health evaluation.

1.2 USE OF THE DIRECTORY

The **Directory** is organized into ten chapters and three appendices. Chapter 2 develops a conceptual flow chart for conducting *risk assessments* and identifies information categories related to each major *risk assessment* element. It further identifies which information sources are related to each category. Chapters 3-8 provide descriptive information on the six categories of information sources in the **Directory**: data bases; data files and tapes; models; manuals, directories and periodicals; publications; and human resources. Chapters for the first three categories -- data bases, data files and tapes, and models -- are divided into sections describing **EPA** developed information/resources and other information/resources. The glossary has terms and acronyms in typical usage in the field of *risk assessment* and to the **Directory**. Appendix A provides more detailed information about the types of information found in each data base by categories or subcategories, and Appendix B provides information about the data bases that makes it easier to access or use them. Finally, Appendix C is a more specific version of Chapter 2 which has been tailored for the performance of *risk assessments* under the *Superfund* public health evaluation process.

Exhibit 1-1 arrays by chapter and describes the types of information sources contained in the **Directory**. In general the information sources can be divided into two types. The first type includes data bases, files and tapes, and models. These sources of information typically contain highly detailed and chemical specific data. Much of the available information from these sources is automated, i.e. accessible by computer. In particular, many of the environmental models are computer-based. Therefore this type of information source would most likely be used to respond to highly specific information needs.

The second type of information source includes manuals, directories, periodicals, publications, and human resources. While perhaps more varied in nature than the first type of information source, the second type of information source is best suited for cases involving less specific or less structured information requests. To obtain information of a more general nature, for example, it may be most appropriate to consult a guidance manual. An individual would likely be contacted to help solve a problem or identify additional information sources.

To use the **Directory** a user would first decide whether his/her information need could be met by either the first or second type of information source described above. If the information need were highly specific and/or related to chemical-specific data, i.e. answerable by the first type of information source, the user would follow a two-step procedure. First, he/she would consult Chapter 2 to determine the information category where his/her information need could be satisfied. These categories are summarized in

Exhibit 2-1. Once a category (or categories) was identified, the user would refer to the remainder of Chapter 2 to learn which specific data bases, data files and tapes, and environmental models relate to the appropriate information category.

The second step would be to refer to later chapters that contain descriptions of specific information sources. Chapters 3 and 4 describe individual data bases and data files and tapes, respectively. Each of these chapters has a heading for **EPA** information sources (e.g. data bases) and **non-EPA** information sources. Underneath each heading, specific sources are listed and described alphabetically. In addition to these brief descriptions, Appendices A and B contain summaries of specific data categories and system attributes to help the user select among specific sources. Chapter 5 describes environmental models and is organized into sections on **EPA** and **non EPA** models.

If a user's information need were more general, i.e. answerable by the second type of information source, he/she would immediately consult Chapter 6, 7, or 8 respectively. Chapter 6 lists manuals, directories, and periodicals, each alphabetically. Chapter 7 lists specifically-cited publications organized by the four major *risk assessment* categories: hazard identification, dose-response assessment, exposure assessment, and risk characterization; Chapter 7 also presents generically referenced publications (i.e., families of related documents). Chapter 8 provides the names of regional and headquarters **EPA** staff who can assist

EXHIBIT 1-1

ORGANIZATION OF THE RISK ASSESSMENT INFORMATION DIRECTORY

TYPE OF INFORMATION RESOURCE	RELEVANT CHAPTER(S)	DESCRIPTION OF INFORMATION RESOURCES AS CONTAINED IN THE DIRECTORY
Data Bases, Files and Tapes	2, 3, 4, and Appendices A & B*	Banks of data segregated into specific categories under hazard identification, dose response, exposure assessment, and risk characterization
Models	5	Computerized and desktop models related to exposure and dose-response assessment
Manuals, Directories, and Periodicals	6	Guidance manuals, instruction handbooks, information directories, and periodic publications (e.g., newsletters) related to the overall risk assessment process
Publications	7	General literature references segregated into publications useful for hazard identification, dose-response assessment, exposure assessment, and risk characterization
Human Resources	8	**EPA** headquarters and regional personnel designated as contact points for risk assessment issues

* Refer to Exhibit 1-2 for a flow diagram showing how Chapters 2, 3, and 4, and Appendices A and B are related.

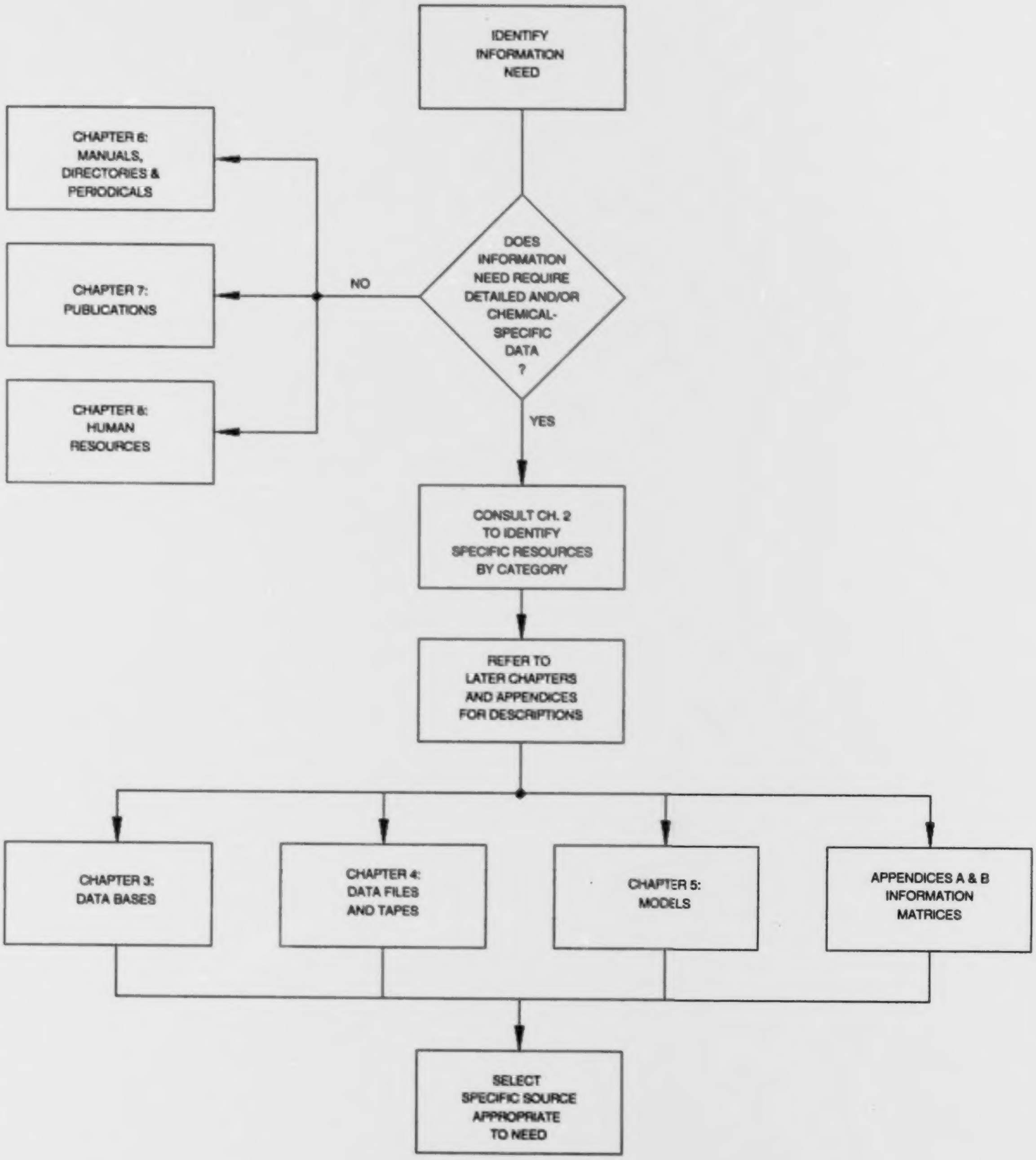
with *risk assessment* information. The organization of the **Directory** is summarized in Exhibit 1-1 which lists the types of information that can be found in the various chapters. Exhibit 1-2 is a flow chart that illustrates how the various chapters of the **Directory** might be used in searching for specific information.

Suppose for example a user wanted to find out more information about a contaminant that he/she knew very little about. A search for information would probably begin in Chapter 2 of the **Directory**. It might be necessary to better identify the hazardous substance by going to the appropriate heading (2.1 HAZARD IDENTIFICATION; 2.1.1 Substance Identification). Under that subcategory the user would find the various data bases (listed as **EPA** or **non-EPA**) and data files and tapes that traditionally contain relevant information (Chemical Abstract System [CAS] numbers; synonyms; etc.). If the user was unfamiliar with the listed information sources, it would then be appropriate to go to Chapter 3 of the **Directory** to review short descriptions of the sources, or to Appendices A or B of the **Directory** for more information about the actual contents of the sources or about the characteristics of the sources themselves, respectively. In this manner, first identifying a potential information source in the appropriate subcategory of Chapter 2 and then characterizing that source in the subsequent chapters or appendices, a user would be able to gather the information required for making a decision about which specific source or sources would be most helpful in conducting a *risk assessment*.

In actuality, it will not always be necessary for a user of the **Risk Assessment Information Directory** to go stepwise through the entire **Directory**. Someone familiar with the layout of the **Directory** should be able to go directly to those information categories of interest in order to find relevant sources.

EXHIBIT 1-2

USE OF THE RISK ASSESSMENT INFORMATION DIRECTORY


IDENTIFY INFORMATION NEED
DOES INFORMATION NEED REQUIRE DETAILED AND/OR CHEMICAL-SPECIFIC DATA ?
NO
CHAPTER 6: MANUALS, DIRECTORIES & PERIODICALS
CHAPTER 7: PUBLICATIONS
CHAPTER 8: HUMAN RESOURCES
YES
CONSULT CH. 2 TO IDENTIFY SPECIFIC RESOURCES BY CATEGORY
REFER TO LATER CHAPTERS AND APPENDICES FOR DESCRIPTIONS
CHAPTER 3: DATA BASES
CHAPTER 4: DATA FILES AND TAPES
CHAPTER 5: MODELS
APPENDICES A & B INFORMATION MATRICES
SELECT SPECIFIC SOURCE APPROPRIATE TO NEED

CHAPTER 2

INFORMATION RESOURCES AND THE RISK ASSESSMENT PROCESS

The information sources useful for any *risk assessment* are dictated by the nature of the particular task or question being addressed. There are many different types of *risk assessment* activities either ongoing or under development, and they often require process or site-specific data unique to the effort. Consequently, in order to create a manageable **Directory** of sources, it is necessary to define the type of *risk assessment* activities the **Directory** is targeted toward.

EPA has functionally adopted the *risk assessment* strategy and terminology set out in a recent review of *risk assessment* activities in the federal government (National Academy of Sciences [NAS], 1984).[3] As set out in the NAS committee's recommendations, the procedural steps required to describe the risks associated with a chemical hazard include the following:

- Hazard Identification
- Dose-Response Assessment
- Exposure Assessment
- Risk Characterization

This chapter of the **Directory** summarizes the available information resources that might be of use in performing these tasks. Exhibit 2-1 is an outline of the **EPA**-adopted steps in *risk assessment* and identifies by subheadings, potential information required for each step. For each of the subheadings of information requirements, there is a descriptive statement about the purpose and type of information needed, followed by a listing of the major relevant data bases and data files and tapes. Chapters 3 and 4 of the **Directory** can then be used to characterize more fully, and gain access to, particular information resources. It should be emphasized that the steps of a *risk assessment* as outlined in Exhibit 2-1 do not necessarily always take place or follow in the diagrammed order. For example, it might be necessary to perform the exposure assessment prior to the dose-response assessment in order to determine if any potential hazard exists for a population of concern. If it is unlikely that such a hazard exists because the population of concern would not be exposed, then there would be no need to perform the dose response assessment.

In addition to the lists of resources in this Chapter, further information can be obtained from models; manuals, directories, and periodicals; publications; and human resources which are listed and described in Chapters 5 through 8 of the **Directory**.

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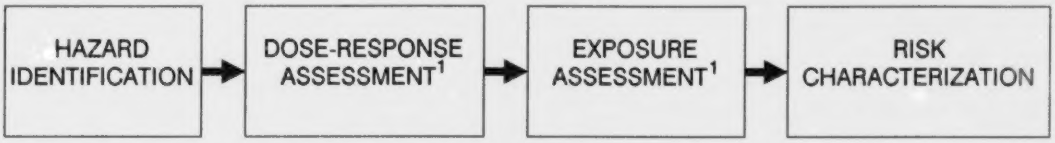
[3] National Academy of Sciences, *Risk Assessment in the Federal Government.* National Academy Press. 1984.

EXHIBIT 2-1

INFORMATION ELEMENTS ASSOCIATED WITH THE EPA RISK ASSESSMENT PROCESS



- Substance Identification
- Physical/Chemical Properties
- Hazard Characterization
  - ¤ Epidemiologic Data
  - ¤ Toxicity Data
    - – Animal Bioassay Data (Chronic Toxicity)
    - – Short Term Studies (Acute/Subacute Toxicity)
- Comparision of Molecular Structures

- Pharmacological Data
  - ¤ Low-Dose Extrapolation
  - ¤ Animal-to-Human Dose Extrapolation
  - ¤ Duration Extrapolation
  - ¤ Route Extrapolation

- Physical/Chemical Properties
- Environmental Characteristics
- Chemical Concentrations in Environmental Media
  - ¤ Partitioning
  - ¤ Transport/transformation
- Population at Risk
- Exposure
  - ¤ Route
  - ¤ Magnitude
  - ¤ Duration

- Environmental Effects
  - ¤ Aquatic
  - ¤ Terrestrial
- Human Risk Assessment
  - ¤ Carcinogens
  - ¤ Noncarcinogens

[1] The order of Dose-Response Assessment and Exposure Assessment may be in reverse of that shown.

2.1 HAZARD IDENTIFICATION

Hazard identification is the first of four major steps in performing a risk characterization under the current **EPA** supported guidelines. As such, hazard identification is primarily directed towards establishing what the human health hazards are with respect to a specific chemical. In order to estimate the hazards, four types of information are commonly used:

- Substance Identification
- Physical/Chemical Properties
- Hazard Characterization
- Comparisons of Molecular Structures

These types of approaches are listed below as subcategories with various relevant information resources.

2.1.1 Substance Identification

The information resources listed below are useful in identifying a chemical substance. Data items that may be obtained from these sources include such identifiers as *CA Index* name, *CAS Registry* number, synonyms, molecular formulas, chemical descriptions/compositions, and chemical production data.

EPA Data Bases (see Section 3.1)

- CHEMD
- CICIS
- GI
- OHM-TADS
- ORALTOX
- TSCA INITIAL INVENTORY
- TSCA PLUS

Non-EPA Data Bases (see Section 3.2)

- ACS JOURNALS ONLINE
- CA SEARCH
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICAL IN HUMAN TISSUES AND FLUIDS
- CHEMLINE
- CHEMSEARCH
- CHEMSIS
- CHEMZERO
- CRGS
- DARC
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- HEILBRON
- LOG P DATABASE
- NPIRS
- OHS-MSDS
- RNSS
- RTECS
- TOXICOLOGY DATA BANK

EPA Data Files and Tapes (see section 4.1)

- TSCA PREFERRED NAME FILE AND SYNONYM FILE

2.1.2 Physical/Chemical Properties

The data bases listed under this heading are useful sources of information for physical/chemical properties, which may be needed to identify the hazards of a contaminant.

EPA Data Bases (see Section 3.1)

- CHEMD
- GEMS
- OHM-TADS
- PDMS
- PHRED
- SPHERE

- TSDF

Non-EPA Data Bases (see Section 3.2)
- CA SEARCH
- CASSI
- CESARS
- CHEMLINE
- CHEMTRAN
- CIS
- DORTMUND VLE DATA BANK
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- HEILBRON
- LOG P DATABASE
- NPIRS
- OHS-MSDS
- RNSS

EPA Data Files and Tapes (see Section 4.1)
- WATER SOLUBILITY DATA

2.1.3 Hazard Characterization

One may characterize the expected health hazards associated with exposure to a contaminant based on analysis of previously collected epidemiologic and toxicity data.

Epidemiologic Data

Epidemiologic data include information on the exposure and toxic responses of human and/or animal populations to chemical substances. They may include information on the frequency and geographic distribution of an observed health effect within a population. The following are data bases, files, and tapes that are useful sources of epidemiologic data.

EPA Data Bases (see Section 3.1)
- CECATS
- CSDCLEANS
- CRIB
- EPACASR
- GI
- HEOX
- OHM-TADS
- SPHERE DERMAL ABSORPTION DATA BANK

Non-EPA Data Bases (see Section 3.2)
- CESARS
- CHEMICAL EXPOSURE
- CTCP
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- NOHS
- NOES
- OCIS
- OHS-MSDS

- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE RPROJ

EPA Data Files and Tapes (see Section 4.1)

- EPID
- FILES OF EXPOSURE ASSESSMENTS FOR EXISTING CHEMICALS

Toxicity Data

Toxicity data include information on the response of an organism to a dose of a chemical substance through various routes of exposure. Such data may be for chronic toxicity or acute/subacute toxicity.

Animal-Bioassay Data (Chronic Toxicity)

Chronic toxicity data pertain to the response of an organism to repeated, long-term exposure to a contaminant. The length of exposure and time for response may vary with the particular organism involved. The following are information resources for chronic toxicity or animal bioassay data.

EPA Data Bases (see Section 3.1)

- AIR TOXICS CLEARINGHOUSE
- CECATS
- CRIB
- EEFIS
- EPACASR
- GI
- GTDMIS
- IRIS
- OHM-TADS
- ORALTOX
- PDMS
- RAD
- SPHERE
- STARA
- WBC

Non-EPA Data Bases (see Section 3.2)

- AGRICOLA
- AQUALINE
- ASFA
- BIOSIS
- CBDS
- CESARS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUE AND FLUIDS
- CTCP
- ENVIROLINE
- ENVIRONMENTAL FATE DATA BASES BIOLOG
- HSDB
- HAZARDLINE
- MEDLINE

- NIOSHTIC
- NPIRS
- NTIS
- OHS-MSDS
- PASCAL
- PROFILE
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE / HEEP / CBAC / RPROJ / TD3

EPA Data Files and Tapes (see Section 4.1)

- GASTRO-INTESTINAL EFFECTS LITERATURE
- ITC CHEMICAL SCORES
- TSCA NEW CHEMICALS
- TSCA SECTION 4 - CHEMICAL BIBLIOGRAPHIES

Short-term Studies (Acute/Subacute Toxicity)

Acute/subacute toxicity refers to the immediate or short term toxicological response of an organism to either a single dose or relatively few doses of a chemical substance. Useful information resources for these types of data include the following:

EPA Data Bases (see Section 3.1)

- ACUTE HAZARDS DATA
- AIR TOXICS CLEARINGHOUSE
- CECATS
- CSDCLEANS
- DEEP
- EEFIS
- EPACASR
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GI
- HEOX
- IRIS
- NEUROTOXICITY DATA
- OHM-TADS
- ORALTOX
- PDMS
- PDAS
- RAD
- SPHERE
- STARA

Non-EPA Data Bases (see Section 3.2)

- ASFA
- BIOSIS
- CESARS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CHEMLINE
- CIS
- CLEARINGHOUSE ON HEALTH INDEXES

- CTCP
- ENVIROLINE
- ENVIRONMENTAL FATE DATA BASES
- HSDB
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NPIRS
- OHS-MSDS
- PASCAL
- PROFILE
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE / HEEP / CBAC / TOXICOLOGY BIBLIOGRAPHY / TD3

EPA Data Files and Tapes (see Section 4.1)

- ETHOX
- FILES OF EXPOSURE ASSESSMENTS FOR EXISTING CHEMICALS
- GASTRO-INTESTINAL EFFECTS LITERATURE
- ITC CHEMICALS SCORES
- TSCA NEW CHEMICALS
- TSCA SECTION 4 CHEMICAL BIBLIOGRAPHIES

2.1.4 Comparisons of Molecular Structures

The potential hazards associated with a given chemical substance may be identified by evaluating the hazards of other substances with similar molecular structures or similar components (functional groups) of molecular structures. Data bases that contain information to assist in comparing molecular structures between different chemical substances include the following.

EPA Data Bases (see Section 3.1)

- CHEMD
- OHM-TADS

Non-EPA Data Bases (see Section 3.2)

- ACS JOURNALS ONLINE
- CA SEARCH
- CASSI
- CESARS
- CHEMLINE
- CHEMSEARCH
- CHEMSIS
- CHEMTRAN
- CHEMZERO
- DARC
- DATA LOG CHEMFATE
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- HEILBRON
- LOG P DATABASE
- RNSS
- SANSS

2.2 DOSE-RESPONSE ASSESSMENT (TOXICOKINETICS AND BIOEFFECTS)

Many factors must be taken into consideration when evaluating dose-response data for use in *risk assessments*. In the minority of toxic chemicals that will be encountered, epidemiologic data may make it possible to predict dose-responses based upon knowledge of exposures and health effects in humans. Various factors, including age, illness, genetic variability, etc., combine to make such estimations complex, but less uncertain than estimations of human responses to specific exposure levels based solely upon animal experiments.

The four primary dose-response tasks related to *risk assessments* are the following:

- Low-Dose Extrapolation
- Animal-to-Human Dose Extrapolation
- Duration Extrapolation
- Route Extrapolation

Animal experimental data may be the only biological information available about the toxic effects of a chemical. Extrapolations of such data must be used to predict human responses, usually without sufficient knowledge of species differences. Consequently, various adjustments are made for size differences, or to account for differences in metabolic rates. In addition, extrapolations of dose-response relationships may be required, even when human experimental data are available, to account for differences in dose levels, periods of exposure, and routes of exposure for the test individual(s) and those expected for other individuals. The types of information resources available to help make these extrapolations as scientific as possible are listed below in each category

2.2.1 Low-dose Extrapolation

Low-dose extrapolation involves estimating the human response to a given chemical dose based upon observed human responses at higher dose levels. Such extrapolations may require considerable adjustment to account for the differences between humans at an exposure point and the human(s) for which such "high-dose" data are available. Data bases that may be useful in performing high to low-dose extrapolations are listed below.

EPA Data Bases (see Section 3.1)
- CRIB
- EERF
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GTDMIS
- ORALTOX
- PDMS
- SPHERE
- STARA

Non-EPA Data Bases (see Section 3.2)
- CBDS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS

- HAZARDLINE
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

2.2.2 Animai-to-Human Dose Extrapolation

Human responses to a chemical dose may be estimated from non human experimental data, taking into account differences in size, metabolic rates, and other factors. The following are data bases that contain animal experimental data, as well as information useful in extrapolating those data to human dose response relationships.

EPA Data Bases (see Section 3.1)
- GTDMIS
- ORALTOX
- SPHERE
- STARA

Non-EPA Data Bases (see Section 3.2)
- ASFA
- CBDS
- CHEMICAL EXPOSURE
- TOXICOLOGY DATA BANK
- TOXLINE

2.2.3 Duration Extrapolation

Dose-response studies covering relatively short periods are frequently inadequate for evaluating chronic exposures. Therefore, longer term dose-response or dose-severity relationships must be inferred from sub-chronic and shorter term studies. Data bases that may be useful in carrying out such a "duration extrapolation" are listed below.

EPA Data Bases (see Section 3.1)
- CSDCLEANS
- DEEP
- GTDMIS
- IRIS
- NEUROTOXICITY DATA
- ORALTOX
- PDAS
- RAD
- SPHERE
- STARA
- TSCATS

Non-EPA Data Bases (see Section 3.2)

- CBDS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMLINE
- RTECS
- TOXLINE

2.2.4 Route Extrapolation

There may be instances when an investigator desires dose response information for a given route of exposure, but only has available information pertaining to a different route of exposure. For these cases, if sufficient data are available, response data can be extrapolated across different routes of exposure. The following data bases contain dose-response data for various exposure routes, which may facilitate making route extrapolations:

EPA Data Bases (see Section 3.1)

- INHALATION LITERATURE
- IRIS
- NEUROTOXICITY DATA
- ORALTOX
- RAD
- SPHERE
- TSCATS

Non-EPA Data Bases (see Section 3.2)

- CBDS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMLINE
- HAZARDLINE
- RTECS
- TOXLINE

2.3 EXPOSURE ASSESSMENT

The primary purpose of an exposure assessment is to estimate the actual concentration of a chemical to which humans might be exposed. Occasionally, there may be analytical data on exposure levels at human receptors, but more typically the exposure must be estimated based upon reported chemical concentrations in the environmental media of concern.

The following subcategories list types of information and data which can be used to make exposure assessments when chemical concentration data are incomplete:

- Physical/Chemical Properties
- Environmental Fate and Transport Characteristics
- Chemical Concentrations in Environmental Media

- Population at Risk
- Exposure Route, Magnitude, and Duration

Information resources that are useful in performing exposure assessments are listed below by subcategories.

2.3.1 Physical/Chemical Properties

The data bases listed below are useful sources of information for physical/chemical properties which may be needed to determine the environmental fate and transport of a contaminant.

EPA Data Bases (see Section 3.1)

- CHEMD
- GEMS
- OHM-TADS
- PDMS
- PHRED
- SPHERE
- TSDF

Non-EPA Data Bases (see Section 3.2)

- CA SEARCH
- CASSI
- CESARS
- CHEMLINE
- CHEMTRAN
- CIS
- DORTMUND VLE DATA BANK
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- HEILBRON
- LOG P DATABASE
- NPIRS
- OHS-MSDS
- RNSS

2.3.2 Environmental Fate and Transport Characteristics

These characteristics refer to features of a chemical (e.g., partition coefficients, retardation factors, bioaccumulation factors, and degradation rates) and to the transport mechanisms in effect as a chemical migrates through various environmental media. See chapter 5 of this **Directory** for a listing of environmental fate and transport models. The documentation to such models frequently contains substantial data bases of environmental fate and transport information.

2.3.3 Chemical Concentrations in Environmental Media

Chemical concentrations in environmental media are important in two different respects. First, concentrations at exposure points must be determined in order to estimate human health risks and environmental effects. Second, chemical concentrations in environmental media are important factors affecting the transport of a constituent to an exposure point. The following are information resources that contain data on chemical concentrations in the ambient environment, quality data for waste streams released to the environment, and observations of various environmental characteristics that may impact a chemical's concentration (e.g., stream flow rates and atmospheric dispersion data).

EPA Data Bases (see Section 3.1)

- AIR TOXICS CLEARINGHOUSE
- EERF
- ERFD
- GEMS
- MICROBIOLOGICAL DATA
- PDMS
- STORET
- TSDF

Non-EPA Data Bases (see Section 3.2)

- DMS
- MWDI
- NEDRES
- NGWIC
- NPIRS
- SIRS
- WATERLINE
- WATER RESOURCES ABSTRACTS
- WATSTORE
- WDSD
- WRSIC

EPA Data Files and Tapes (see Section 4.1)

- CHAMP
- CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA
- EPID
- SAROAD

Non-EPA Data Files and Tapes (see Section 4.2)

- ADR
- AOWF
- BASIC WELL DATA FOR PROFESSIONAL PAPER 796
- GEOECOLOGY DATA BASE
- INDEX TO GEOLOGIC MAPS
- MIXING HEIGHT STUDIES
- NASQAN
- STABILITY ARRAY
- SUMMARY OF THE MONTHLY CO-OP ELEMENT FILE
- SURFACE AIRWAYS OBSERVATIONS U.S. SOIL TEMPERATURES
- VOLATILE ORGANIC CHEMICALS IN THE ATMOSPHERE: AN ASSESSMENT OF AVAILABLE DATA

2.3.4 Population at Risk

The information resources listed in this section are useful in identifying the location, and other characteristics of a human population within a given area. Information included in these data bases include such items as census results, land and water use data, and human health monitoring data for a particular population. These data are helpful in determining the population that may be exposed to a contaminant released in the environment.

EPA Data Bases (see Section 3.1)
- EERF
- ERFD
- GEMS
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- PERMDATA
- RAD
- WBC

Non-EPA Data Bases (see Section 3.2)
- POPLINE

EPA Data Files and Tapes (see Section 4.1)
- EPID
- RESOURCE CONSERVATION RECOVERY ACT NOTIFICATION DATA FILE
- SM/HD

Non-EPA Data Files and Tapes (see Section 4.2)
- GEOECOLOGY DATA BASE
- INDEX TO GEOLOGIC MAPS

2.3.5 Exposure Route, Magnitude and Duration

An exposure route is the mode by which humans or environmental entities are exposed to a chemical substance. For example, human and animal exposure routes include inhalation, ingestion, and direct (dermal) contact. The magnitude of exposure reflects the amount of chemical intake or extent of direct contact by an organism. Exposure magnitudes are dependent on the length of time, or duration, that an organism takes in or remains in contact with a substance. Parameters useful in assessing exposure routes, magnitudes, and durations include dermal absorption data; oral intake data; toxicological data in dose duration terms; and experimental and real-life bioassay data involving known exposure routes and durations. These types of data are available through the following information resources.

EPA Data Bases (see Section 3.1)
- CRIB
- GI
- GTDMIS
- INHALATION LITERATURE
- NATIONAL HUMAN ADIPOSE TISSUE DATA
- OHM-TADS
- ORALTOX
- PDMS
- SPHERE
- STARA
- WBC

Non-EPA Data Bases (see Section 3.2)
- BIOSIS
- CBDS
- CESARS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CIS
- CLEARINGHOUSE ON HEALTH INDEXES
- CTCP
- EMBASE
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- MEDLINE
- NGWIC
- NIOSHTIC
- NPIRS
- PASCAL
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

EPA Data Files and Tapes (see Section 4.1)
- CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA
- NHMP

2.4 RISK CHARACTERIZATION

The risk characterization estimates the health risks to humans and/or the environment at chemical concentration levels determined in the exposure assessment. As such, the risk characterization often relies upon various assumptions made in the exposure assessment, upon estimations made in the dose-response assessment, and upon conclusions reached in the hazard identification procedures. The risk characterization should address all types of risks including:

- Environmental Effects (aquatic and terrestrial)
- Human Risk Assessment (carcinogens and non carcinogens)

Models of risk characterization and references to standards used in making risk characterizations are listed below within subcategories.

2.4.1 Environmental Effects

Environmental effects include changes in aquatic and terrestrial natural resources brought about by exposure to chemical substances. Knowledge of such effects may be important in analyzing chemical migration pathways and potential human exposures; however, knowledge of environmental effects is also important in analyzing the non-human risks of a chemical release. Information that can be found in the following data bases includes data on natural resource injuries caused by exposure to chemicals.

EPA Data Bases (see Section 3.1)
- EEFIS
- OHM-TADS
- ORALTOX
- PDMS
- STORET

Non-EPA Data Bases (see Section 3.2)
- AQUALINE
- ASFA
- BIOSIS
- CBDS
- CHEMICAL EXPOSURE
- NIH/EPA CIS
- NPIRS
- TOXICOLOGY DATA BANK

EPA Data Files and Tapes (see Section 4.1)
- ECOLOGICAL EFFECTS DATA

Non-EPA Data Files and Tapes (see Section 4.2)
- GEOECOLOGY DATA BASE

2.4.2 Human Risk Assessment

Toxic effects to humans can be separated into either carcinogenic or noncarcinogenic effects, and different methods are used to characterize health risks for exposure to carcinogens and noncarcinogens.

Carcinogens

The following information resources contain data helpful in characterizing human health risks caused by exposure to carcinogenic substances. Data included in these resources include research results on carcinogenic effects, testing and regulatory activities involving carcinogens, and toxicity data for potential carcinogenic effects (e.g., ten percent effective doses and carcinogenic potency factors).

EPA Data Bases (see Section 3.1)
- CARCINOGENICITY LITERATURE
- CECATS
- EPACASR
- GTDMIS
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- IRIS
- SPHERE

Non-EPA Data Bases (see Section 3.2)
- BIOSIS
- CANCERLIT
- CBDS
- CCRIS
- CESARS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CHEMLINE
- CIS

- CLEARINGHOUSE ON HEALTH INDEXES
- EMBASE
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NOES
- NOHS
- NPIRS
- OCIS
- OHS-MSDS
- PASCAL
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

EPA Data Files and Tapes (see Section 4.1)

- POTENTIAL SUBSTANTIAL RISKS

Non-carcinogens

The data bases listed below contain information needed to characterize human health risks for exposure to noncarcinogenic chemicals. Similar to the data bases cited above for assessing carcinogenic effects, these data bases include research results on non-carcinogens and their health effects, relevant testing and regulatory activity information, and toxicity data for noncarcinogenic effects (e.g., minimum effective dose values and acceptable intake levels).

EPA Data Bases (see Section 3.1)

- CECATS
- DEEP
- EPACASR
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GI
- GTDMIS
- HEOX
- IRIS
- NEUROTOXICITY DATA
- OHM-TADS
- PERMDATA
- PDAS
- PHRED
- RAD
- SPHERE
- STARA
- WBC

Non-EPA Data Bases (see Section 3.2)

- BIOSIS
- CESARS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CLEARINGHOUSE ON HEALTH INDEXES

- CTCP
- EMIC
- ENVIRONMENTAL FATE DATA BASES
- ETIC
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NOES
- NOHS
- NPIRS
- OCIS
- OHS-MSDS
- PASCAL
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

EPA Data Files and Tapes (see Section 4.1)

- POTENTIAL SUBSTANTIAL RISKS

CHAPTER 3

DATA BASES

This chapter contains more complete descriptions of the different data bases cited in Chapter 2. It is divided into four main sections:

- 3.1 EPA Data Bases
- 3.2 Non-EPA Data Bases
- 3.3 Producers and Online Services
- 3.4 Access to Data Bases through EPA Libraries

Automated **EPA** and **non-EPA** data bases are listed and briefly described in Sections 3.1 and 3.2, respectively[4]. Some of the items included in this chapter as data bases (e.g., IRIS, OCIS, DARC) are actually ancillary automated systems which facilitate the research and manipulation of data; these systems can be distinguished from sources of data by their description as "indexing," "tracking," or "search system" under "Type." After the description of each data base, references for additional information are given. For most of the **EPA** data bases, the **EPA** office where the data base resides and a responsible person, are provided. For the **non-EPA** data bases, as well as for a few of the **EPA** data bases, the data base producer and the name of an online service for accessing the data base are cited. The addresses and telephone numbers of these producers and online services are given in Section 3.3. Section 3.4 lists data bases that may be accessed and searched through each of the **EPA** libraries.

3.1 EPA DATA BASES

The following are **EPA** data bases that may be useful in performing risk assessments. Most of these data bases were identified through **EPA's** "Information Systems Inventory," an agency wide compilation of data bases, models, and other information systems.[5] The data bases below were selected from this large inventory because they were identified, by the people who use them, as having the primary purpose of *risk-assessment*.

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[4] For the purpose of this **Directory**, manual Data Bases are considered data files and are presented separately in Chapter 4.

[5] More information on the Information Systems Inventory is available through **EPA's** office of Information Resources Management, Information Management Branch.

ACUTE HAZARDS DATA

Subject: Acute Toxicity of Substances
Content:

This microcomputer-based data base on the acute toxicity of various chemical substances has been developed by OTS in support of an Agency-wide activity following the Bhopal, India, tragedy. This data base will be used to develop materials to circulate to states and localities concerning a list of 400 chemicals identified by **EPA** as being potentially of concern if released to the environment.

Holder: Economics and Technology Division, U.S. **EPA**
Responsible Person: Nilesh Patel
FTS Phone: 8-382-3718

AIR EMISSIONS FROM TREATMENT STORAGE AND DISPOSAL FACILITIES FOR HAZARDOUS WASTE (TSDF)

Subject: Air Emissions
Type: Non-bibliographic
Content:

The TSDF, which is currently under development, will contain information about industrial facilities which treat, store, or dispose of hazardous waste. Data to be compiled in TSDF include company names, locations, and descriptions, the size of each site, waste stream compositions, and physical chemical properties. In addition, air emission models and dispersion models will be included. The TSDF will be used to generate air emission inventories to support future air pollution regulations.

Holder: Office of Air and Radiation
Responsible Person: Gene Smith
FTS Phone: 8-629-5571

AIRBORNE PARTICULATE AND PRECIPITATION DATA (ERFD)

Subject: Atmospheric Radiation Data
Type: Non-bibliographic
Content:

This data base contains data on gross beta and gamma concentration in samples of airborne particulates and precipitation. Monitoring results are given in terms of maximums, minimums, and averages. The location of the sampling point (city and state) is also included.

Holder: Office of Radiation Programs
Responsible Person: Gerry Luster
FTS Phone: 8-534-7615

AIR TOXICS CLEARINGHOUSE

Subject: Toxic Air Pollutants
Type: Bibliographic and Information Search
Content:

This data base was developed to help exchange information among state and local environmental agencies and the **EPA**. The contents include over 60,000 records on subjects like: control programs, correspondence, publications, reports, and data of states' developed and developing programs. This data base contains the same information as the National Air Toxics Clearinghouse (NATICH) described later in this section. Therefore, if the Air Toxics Clearinghouse proves difficult to access through the contacts outlined below, one can attempt to access NATICH.

Time Span: Varies w/file
Updating: Varies w/file

Holder:	Office of Air Programs. U.S. **EPA**
Online Service:	Government access through Account with **EPA**. On **EPA** IBM Mainframe. Private access through NTIS.
Contact:	Dave Patrick or Karen L. Blanchard (919) 541-5519

CARCINOGENICITY LITERATURE

Subject:	Carcinogenicity
Type:	Bibliographic
Content:	

OTS's Health and Environmental Review Division (HERD) has developed a microcomputer based summary of literature citations relating to chemical carcinogenicity. Currently, the data base consists of more than 2,000 records covering approximately 600 chemicals.

Holder:	Office of Toxic Substances, HERD
Responsible Person:	Samir Zakhari
FTS Phone:	8-382-4295

CBI GLOBAL

Subject:	Environmental and Health Effects
Type:	Indexing System
Content:	

This system, when completely loaded, will be the Confidential Business Information (CBI) version of the GLOBAL Indexing System (see below). It will consist of GLOBAL plus TSCA CBI information of the same type.

Holder:	Office of Toxic Substances, Information Management Division
Responsible Person:	Michele Zenon
FTS Phone:	8-382-3534

CECATS

see CSB EXISTING CHEMICAL ASSESSMENT TRACKING SYSTEM

CHEMD

see OTS CHEMICAL DIRECTORY

CHEMICALS IN COMMERCE INFORMATION SYSTEM (CICIS)

Subject:	Chemical Manufacturing and Importation
Type:	Non-bibliographic
Content:	

CICIS contains manufacturing information on chemicals approved for production under TSCA. As of July 1980, it lists chemicals manufactured in or imported to the U.S. for commercial use, the amount of production or import in 1977, and the locations of production. Information considered trade secret by the chemical industry is included in a confidential version of CICIS known as the Confidential Business Information (CBI) Inventory, which may only be accessed by cleared individuals with a need to know.

Holder:	Office of Toxic Substances
Responsible Person:	Maureen Guild
FTS Phone:	8-382-3623

CSB EXISTING CHEMICAL ASSESSMENT TRACKING SYSTEM (CECATS)

Subject: Chemical-Specific Hazard Information
Type: Document tracking
Content:

CECATS is an automated document tracking system designed to aid the Chemical Screening Branch (CSB) in reviewing data on existing chemicals and selecting those substances that require additional attention by the Office of Toxic Substances (OTS). The system provides storage, retrieval, verification trails, data manipulation, and report generation for information on existing chemicals associated with: TSCA Section 8(e) submissions, For Your Information (FYI) submissions, Chemical Hazard Information Profiles (CHIP), Pre-Chip screenings, and Substitute Hazard Profiles. These sources provide information on chemical identities, health and environmental effects, chemical uses, and market information. Information on the status of a chemical within OTS is also provided.

Holder: Office of Toxic Substances
Responsible Person: James Darr
FTS Phone: 8-382-3470

CLINICAL STUDIES DIVISION, CLEANS CLEVER CLINICAL STUDY DATA (CSDCLEANS)

Subject: Human Health Effects From Airborne Contamination
Type: Non-bibliographic
Content:

This data base contains human health related data generated from the Clinical Studies Division Chapel Hill Facility. These studies involve experiments in which human subjects perform a variety of maneuvers while residing in polluted or clean air chambers. Data maintained in the system include pulmonary function measurements, heart, stress, and other medical information. Results of the pulmonary studies are used in support of air quality standards.

Holder: Office of Health Research
Responsible Person: John O'Neil
FTS Phone: 8-629-2602

CRITERIA REFERENCE INFORMATION BANK (CRIB)

Subject: Air Quality and Health Effects
Type: Bibliographic
Content:

The CRIB data base contains bibliographic information identifying sources cited in air quality criteria and health assessment documents. This information is retrievable by author, title, and keyword-in context. A full text of the document is available, although no abstracts are provided

Holder: Office of Health and Environmental Assessment
Responsible Person: Doug Fennell
FTS Phone: 8-629-3789

DYER EEG EVOKED POTENTIAL (DEEP)

Subject: Nervous System Health Effects
Type: Non-bibliographic
Content:

Data are maintained on the physiological consequences of acute and/or chronic toxicant exposure on nervous system functions.

Holder: Office of Health Research

Responsible Person: Robert Dwyer
FTS Phone: 8-629-2760

EASTERN ENVIRONMENTAL RADIATION FACILITIES (EERF) SAMPLE DATA BASE

Subject: Environmental Radiation Monitoring Data
Type: Non-bibliographic
Content:

On regular schedules, about a dozen environmental sampling networks submit samples to the Eastern Environmental Radiation Facilities for analysis of radiation levels. These samples are from a wide variety of media (e.g., soil, surface water, ground water, drinking water, and air). This data base contains the results of these sample analyses.

Holder: Office of Radiation programs
Responsible Person: Jon Broadway
FTS Phone: 8-534-7615

EPA CHEMICAL ACTIVITIES STATUS REPORT (EPACASR or CASRS)

Subject: Chemistry
Type: Reference (Bibliographic)
Content:

This data base contains more than 19,000 references to over 8,000 chemical substances reviewed or under review by the U.S. **EPA** in the course of its regulatory activities and scientific research. A summary of **EPA** activities is provided with each named substance.

Time Span: Up to February, 1984
Updating: It is not updated
Responsible Person: Doug Sellers
Telephone: (202) 382-2320

ENVIRONMENTAL EFFECTS/FATE INFORMATION SYSTEM (EEFIS)

Subject: Chemical Fate; Environmental Effects
Type: Non-bibliographic (Textual-Numeric)
Content:

EEFIS provides user-friendly, menu-driven access through any IBM compatible personal computer to chemical fate and environmental effects information on selected chemicals. The data base contains a variety of information resources, published and unpublished, such as journal articles, correspondence, tables, FYI studies submitted to **EPA** by industry, non CBI Section 8(d) studies, and Section 4 information. EEFIS contains chemical fate and environmental effects data (1) on chemicals identified for priority testing consideration by the interagency testing committee; (2) on chemicals for which **EPA's** Test Rules Development Branch has internally generated tests rules or has received requests from other program offices to promulgate test rules; and (3) generated as a result of **EPA's** requiring testing under Section 4 of TSCA.

Holder: Office of Toxic Substances, Existing Chemical Assessment Division
Responsible Person: John D. Walker
Telephone: (202) 475-8160

ERFD

see AIRBORNE PARTICULATE AND PRECIPITATION DATA

GENERAL RADIATION HEALTH IMPACT EVALUATION

Subject: Radiation Exposure Assessment
Type: Non-bibliographic
Content:

This system is used to assess health impacts resulting from environmental radiation from sources such as radon in surface water, drinking water, and air. Information in the system is also used to assess health effects of gamma radiation levels measured by TLD dosimeters.

Holder: Office of Radiation Programs
Responsible Person: D. Norwood
FTS Phone: 8-534-7615

GLOBAL INDEXING SYSTEM (GI)

Subject: Environmental and Health Effects
Type: Document Indexing/Bibliographic
Content:

This system stores and retrieves various Office of Toxic Substances (OTS) documents and studies collected under TSCA Section 8(d). It covers the 20,000 documents existing in the OTS public files including all original submissions and all TSCA rule-making records. The GI system also covers the submissions on health and safety studies for about 330 substances listed under the TSCA Section 8(d) reporting rule. GI is a document search and review system consisting of a pointer to a fiche copy. Searches can be conducted by using chemical identifiers (e.g., names and CAS numbers), submitting company names, and document identification data.

Holder: Office of Toxic Substances
Responsible Person: Doug Sellers
FTS Phone: 8-382-2320

GENETIC TOXICOLOGY DIVISION BIOASSAY SYSTEM (GTDMIS)

Subject: Health Effects
Type: Non-bibliographic
Content:

This system contains the results of testing various chemical compounds in numerous biological test systems for detecting carcinogenicity or mutagenicity. The results are entered from in-house research (HERL Genetic Toxicology Division), National Cancer Institute reports, and other published genetic toxicology literature.

Holder: Office of Health Research
Responsible Person: Mike Waters
FTS Phone: 8-629-2537

GRAPHICAL EXPOSURE MODELING SYSTEM (GEMS)

Subject: Environmental Fate and Transport; Populations at Risk
Type: Non-bibliographic
Content:

This data base contains 12 datasets and fosters rapid access to 11 environmental fate and transport models designed to assess risks from waste sites which are migrating through various environmental media. The GEMS fate and transport models are discussed in Chapter 5. The data sets include:

CHEMEST Validation. Includes information on solubility, log P, boiling point, and vapor pressure of various substances.

ECONOMIC CENSUS 1977. Contains information on manufacturers, industry, and transportation from 1977.

GEOECOLOGY DATA BASE. Contains county level data from selected areas on agriculture, climate, vegetation, soils, population, water quality, and wildlife.

GAGE. Contains stream flow rates from approximately 99,500 stations throughout the U.S.

IFDPIR. Contains facility data for approximately 28,000 dischargers, excluding POTWS.

IFDIND. Contains facility data for approximately 12,000 discharges who discharge through other facilities, usually POTWS.

MARF 1980 Census. Contains a variety of location identification information, population counts by race, and the numbers of families for all 50 states.

METEOROLOGICAL DATA. Contains data for 394 weather stations in the continental U.S.

POTWS. Contains 1982 survey data from 33,000 publically owned treatment works in the U.S.

REACH. Contains stream reach information, including cataloging unit, segment number, and location for approximately 68,000 reaches throughout the country.

WATER SUPPLY. Contains the number of surface water utilities, the total population served, the number of intake points, and the number of STORET water quality stations associated with surface water utilities.

Holder: Office of Toxic Substances Exposure Evaluation Division
Telephone: (202) 382-3928

HEOX (Oxidants)

Subject: Photochemical Oxidants Health Effects
Type: Non-bibliographic
Content:

This system contains data gathered as part of the oxidant research program, which is concerned with the atmospheric processes, health and environmental impacts, and control of photochemical oxidants. Ozone is the most abundant photochemical oxidant and is of major concern for health and environmental effects. Nitrogen oxides and volatile organic compounds, which are precursors of ozone and other oxidants, are also being evaluated under this research program.

Holder: Office of Health Research
Responsible Person: Richardson Dickerson
FTS Phone: 8-629-2909

INDUSTRIAL STUDIES DATA BASE (ISDB)

Subject: Hazardous Waste Management
Type: Non-bibliographic
Content:

The ISDB contains data extracted from RCRA 3007 questionnaires, sampling and analysis reports, industry contacts and literature. The data tracks the manufacturing processes for specific organic chemicals, the types and amounts of waste streams produced, and how those waste streams are managed. Data on industries for the following substances are included in the ISDB so far: chlorinated organics, organic pesticides, carbamate pesticides, dyes, chlorinated aromatics, pigments, plastics, and resins.

Holder: Office of Solid Waste
Responsible Person: Robert M. Scarberry
FTS Phone: 8-382-4768

INHALATION LITERATURE

Subject: Inhalation toxicity
Type: Non-bibliographic
Content:

This microcomputer based compilation contains information from the open literature on inhalation toxicity. It includes approximately 500 records on 100 chemicals.

Holder: Health and Environmental Review Division
Responsible Person: Ernest Falke
FTS Phone: 8-382-3430

THE INTEGRATED RISK INFORMATION SYSTEM (IRIS)

Subject: Risk characteristics of chemicals
Type: Search system
Content:

IRIS contains results of carcinogenic bioassays, dose-related, responses, toxicity levels, reference doses, and other parameters used to control exposure. The system is organized on a chemical basis and the user can call up a chemical by name and review all material pertinent to it. IRIS should be online in October or November of 1986, and will contain authoritative information on about 200 compounds. Designed as an electronic loose-leaf notebook, IRIS can be accessed through commercial E- mail lines, and provides users with the ability to access, copy, and print information from the data base, while data entry access is limited to maintain the integrity of the file.

Holding Office: Office of Health and Environmental Assessment
Responsible People: Mary Wigginton (FTS 8-382-7315) for status and access information;
Jeffrey Swartou (FTS 8-684-7811) for scientific issues and accuracy of reference doses.

LAKE ANALYSIS MANAGEMENT SYSTEM (LAMS)

Subject: Surface Water Quality Data
Type: Non-bibliographic
Content:

LAMS includes all water quality data gathered by the **EPA** Office of Research and Development research program administered by the Large Lakes Research Station, Grosse Ile, MI since 1971. This data base also includes water quality data since 1968 for the Canadian Great Lakes.

Holder: Office of Environmental Processes and Effects Research
Responsible Person: William Richardson
FTS Phone: 8-226-7811

LEVEL 8(A)

see TSCA 8(a) LEVEL A INFORMATION SYSTEM

MEGA-X LIST

Subject: Chemical Information Index
Type: Information Indexing
Content:

An index of all the chemicals in the CECATS System (see above) that have CAS numbers is being expanded into a system, known as the "Mega-X," which is being developed as the beginning of a master index to OTS information resources.

Holder: Office of Toxic Substances, Existing Chemicals Assessment Division
Responsible Person: James Darr
FTS Phone: 8-382-3470

MICROBIOLOGICAL DATA

Subject: Microbiological Organisms
Type: Non-bibliographic
Content:

OTS's Health and Environmental Review Division (HERD) is developing a microcomputer version of an NIH mainframe system consisting of data on the characteristics of various microbiological organisms. This system will be used by OTS in future reviews of altered micro organisms proposed for commercial introduction and reviewed under TSCA Section 5. The system is scheduled to be running in October 1986.

Holder: Office of Toxic Substances, HERD
Responsible Person: Mark Segal
FTS Phone: 8-382-3502

NATIONAL AIR TOXICS INFORMATION CLEARING HOUSE (NATICH)

Subject: Toxic Air Pollutants
Type: Reference-Search System
Content:

This information was developed to assist state and local air pollution control agencies exchange information on matters pertaining to toxic air pollutants. The contents include:

- Pollutant-specific information
- Source-specific information
- Information related to methods development activities
- Listings of ongoing research and regulatory development projects
- Regulatory program development information
- Bibliographic information
- List of agency sources, contact persons and telephone numbers.

This data base contains the same information as the Air Toxics Clearinghouse described earlier in this section. Therefore, if NATICH proves difficult to access through the contacts outlined below, one can attempt to access the Air Toxics Clearinghouse.

Holder: Office of Air Quality Planning and Standards (OAQPS),
Pollutant Assessment Division.
Responsible Person: Karen Blanchard
FTS Phone: 629-5519

NATIONAL HUMAN ADIPOSE TISSUE DATA

Subject: Chemicals in Adipose Tissue
Type: Non-bibliographic
Content:

OTS's Exposure Evaluation Division (EED) maintains a data base of levels of chemicals measured in human adipose tissue. This data base consists of approximately 22,000 citations covering 20 chemicals.

Holder: Office of Toxic Substances, EED
Responsible Person: Janet Remmers
FTS Phone: 8-382-3583

NEUROTOXICITY DATA

Subject: Neurotoxicity evaluations
Type: Bibliographic and Non-bibliographic
Content:

The Toxic Effects Branch of OTS is developing this microcomputer based database of evaluated neurotoxicity data. This data base will cover the many chemicals reviewed by OTS for neurotoxicity under the Toxic Substances Control Act (TSCA). The database consists of records at the chemical level, individual article level, and at the experimental observational level. The database should be implemented by summer 1986.

Holder: Health and Environmental Review Division
Responsible Person: Michael Cimino
FTS Phone: 8-382-3451

OCEAN DATA EVALUATION SYSTEM (ODES)

Subject: Municipal Effluent Monitoring Data
Type: Non-bibliographic
Content:

This data base contains municipal wastewater effluent monitoring data. Under Section 301(h) of the Clean Water Act, dischargers with 301(h) modified permits are required to submit these monitoring data in order to demonstrate compliance with the law.

Holder: Office of Water (Marine and Estuarine Management)
Responsible Person: Allison Duryee
FTS Phone: 8-755-4911

OIL AND HAZARDOUS MATERIALS-TECHNICAL ASSISTANCE DATA SYSTEM (OHM TADS)

Subject: Environment; Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

A database containing data gathered from published literature on 1334 materials that have been designated oil or hazardous materials. Provides technical support for dealing with potential or actual dangers resulting from the discharge of oil or hazardous substances. Up to 126 data fields, some textual and some numeric, may be present for each record (i.e., one material). A record includes identification of the substance (Chemical Abstracts Service registry number, common and trade names, and chemical formula), physical properties, uses, toxicity, handling procedures, and suggested methods for disposing of spilled materials. Emphasis is placed on the effects of these substances on water quality.

Updating: About 50 new entries each year
Producer: **U.S. EPA**

Online Service: Chemical Information System, Inc. (CIS);
Information Consultants, Inc. (ICI)

ORALTOX
Subject: Acute Oral Toxicity
Type: Non-bibliographic
Content:

ORALTOX contains acute oral toxicity data for rats, wild birds, and wild mice. The data are sorted according to CAS number, chemical name, and the number of carbons in the chemical formula. All of the data are from literature, with rat toxicity data taken from the Registry of Toxic Effects of Chemical Substances and bird and mice data taken from literature by the U.S. Fish and Wildlife Service. Data for about 20,000 chemicals are listed in ORALTOX.

Holder: Office of Toxic Substances
Responsible Person: Richard Clements
FTS Phone: 8-382-4270

OTS CHEMICAL DIRECTORY (CHEMD)
Subject: Physical-Chemical Properties
Type: Non-bibliographic
Content:

CHEMD will provide a common storage and retrieval capability for chemical structures for chemicals in all OTS automated systems. It will provide chemical structure and substructure search features with sophisticated graphics capabilities.

Holder: Office of Toxic Substances
Responsible Person: Michele Zenon
FTS Phone: 8-382-3534

PENTA
Subject: Chemical Case Histories
Type: Indexing System
Content:

PENTA is an enhanced version of the Technical Data Indexing System (TDIS). It contains scientific and regulatory information on all Premanufacturing Notifications, exemption applications, and notices reviewed under the new chemicals and follow up review process. The data base is designed so that cases can be quickly isolated and referenced by their pertinent properties. The objective of PENTA is to automate descriptive information for each case and to provide reviewers information on how similar cases were handled in the past. This system contains confidential business information.

Holder: Office of Toxic Substances, Information Management Division
Responsible Person: Michele Zenon
FTS Phone: 8-382-3534

PERMDATA MANAGEMENT SYSTEM (PERMDATA)
Subject: Radon Monitoring Data
Type: Non-bibliographic
Content:

This data base contains information on radon measurements in air. Data include the sample location, the on and off dates and times for the sample, total sample run time, the thermo- luminescent dosimetry (TLD) detector number and its measures dose rate, alpha and gamma TLD readouts, calibration factors, and radon concentrations.

Holder: Office of Radiation Programs
Responsible Person: Richard D. Hopper
FTS Phone: 8-545-2463

PESTICIDE DOCUMENT MANAGEMENT SYSTEM (PDMS)

Subject: Pesticides
Type: Bibliographic
Content:

The PDMS data base is an on-line index to some 200,000 studies of the properties and effects of pesticides. These are mostly unpublished documents, submitted by the pesticide industry to support regulatory decisions by the Office of Pesticide programs. Microform copies of all indexed documents are maintained in OPP offices. The index supports searching by chemical, subject, and a wide range of other bibliographic and non-bibliographic attributes of each document. Due to widespread claims of data confidentiality by their submitters, ready access to PDMS documents is restricted to EPA staff cleared for access to FIFRA confidential business.

Holder: Office of Pesticide Programs
Responsible Person: John Carley
FTS Phone: 8-557-3240

PESTICIDE INCIDENT MONITORING SYSTEM (PIMS)

Subject: Pesticide Incident Data
Type: Non-bibliographic
Content:

The PIMS contains and retrieves data on "incidents" involving pesticides. The system develops and maintains reporting sources, monitors suspected incidents, and provides confirmatory analyses and data on circumstances of the incident.

Holder: Office of Pesticide Programs
Responsible Person: Jerome Blondell
FTS Phone: 8-557-0320

PHYSIOLOGICAL DATA ACQUISITION SYSTEM (PDAS)

Subject: Health Effects
Type: Non-bibliographic
Content:

The PDAS contains real-time physiological data (e.g., pulmonary function, heart, and stress measurements) from subjects who perform various tests while enclosed in chambers exposing them to various levels of pollutants. One of the pollutants studied is ozone.

Holder: Office of Health Research
Responsible Person: John O'Neil
FTS Phone: 8-629-2602

PUBLIC HEALTH RISK EVALUATION DATA BASE (PHRED)

Subject: Chemical, physical, toxicological data and health based standards
Type: Non-bibliographic with source citations
Content:

This personal computer software package is designed to provide chemical, physical, toxicological data and health-based standards, and criteria for over 400 chemicals that may be found at Superfund sites. The package is intended to accompany the Superfund Public Health Evaluation Manual (Office of Solid Waste and Emergency Response Directive 9285.4-1) which is also the source of most of the data. More detailed information about specific types of data in the data base can be found in the manual, and footnotes and data sources are included throughout the data.

Holder: Office of Emergency and Remedial Response, Policy Analysis Staff
Responsible Person: Craig Zamuda
FTS Phone: 8-382-2201

RADIATION (RAD)

Subject: Non-Ionizing Radiation Health Effects
Type: Non-bibliographic
Content:

This system contains data from an EPA program to evaluate the significance and dose-response characteristics of radiofrequency radiation (including microwaves) exposure. This program is intended to provide the scientific basis for decision making, as well as EPA guidance, on radiofrequency radiation. Data in RAD are useful in identifying and explaining the underlying mechanisms for biophysical interactions, as well as enable better prediction of risk for humans.

Holder: Office of Health Research
Responsible Person: Richard Phillips
FTS Phone: 8-629-2771

SCIENTIFIC PARAMETERS FOR HEALTH AND THE ENVIRONMENT, RETRIEVAL AND ESTIMATION (SPHERE)

Subject: Biomedicine; Chemistry-Properties; Environment; Toxicology
Type: Reference (Bibliographic); Non-bibliographic (Textual Numeric)
Content:

Contains 5 files of information on the health and environmental effects of chemical substances. Data are extracted from the published literature.

AQUATIC INFORMATION RETRIEVAL DATA BASE (AQUIRE). Contains data on acute, chronic, bioaccumulative, and sublethal effects of over 2500 chemical substances on freshwater and marine organisms (excluding bacteria, birds, and aquatic mammals).

DERMAL ABSORPTION DATA BASE. Contains information on the qualitative and quantitative health effects of approximately 650 chemical substances administered to humans and test animals via the dermal route.

ENVIROFATE. Contains information on the environmental fate or behavior (i.e., transport and degradation) of chemicals released into the environment. Chemicals selected for inclusion are produced in quantities exceeding 1 million pounds per year. Data, extracted from published literature, include environmental transformation rates (e.g., biodegradation, oxidation, hydrolysis) and physical and chemical properties (e.g., water solubility, vapor pressure).

GENETOX. Contains mutagenicity information on 3170 chemicals that were tested against 38 biological systems. Data are extracted from published literature.

INFORMATION SYSTEM FOR HAZARDOUS ORGANICS IN WATER (ISHOW). Contains melting point, boiling point, partition coefficient, acid dissociation constant, water solubility, and vapor pressure data for more than 5400 chemicals.

Time Span: 1970-present
Updating: Periodically, as new data become available
Producer: **U.S. EPA**

Online Service: Chemical Information System, Inc., (CIS);
Information Consultants, Inc. (ICI)

STARA

see STUDIES ON TOXICITY APPLICABLE TO RISK ASSESSMENT

STORAGE AND RETRIEVAL OF WATER QUALITY INFORMATION (STORET)

Subject: Water Quality Data
Type: Non-bibliographic
Content:

STORET contains water quality data used by State and **EPA** analysts in making water pollution control decisions (e.g., issuing NPDES permits, establishing water quality standards for toxic pollutants, evaluating the effectiveness of regulatory programs, and assessing concentrations of toxic pollutants). Data contained in STORET include aquatic biological data, hydrologic data, stream reach data, and other related information. Approximately 60 million observations of water quality parameters measured at about 200,000 monitoring sites in the U.S. are included in the data base, along with information on how and where the data were obtained.

Holder: Office of Water
Responsible Person: Phillip Lindestruth
FTS Phone: 8-382-7220

STUDIES ON TOXICITY APPLICABLE TO RISK ASSESSMENT (STARA)

Subject: Toxicological Data
Type: Non-bibliographic
Content:

This system contains available quantitative toxicological data on all **EPA** priority pollutants (water quality and air lists). Data are extracted from peer-reviewed studies which are screened for appropriateness for human health risk estimation. Related software procedures (WYLBUR EXEC) allow generation of formatted tables of the original data, tables of data in human equivalent (dose-duration) terms, and graphs of severity versus dose and duration.

Holder: Office of Health and Environmental Assessment
Responsible Person: Richard Hertzberg
FTS Phone: 8-684-7582

TSCA INITIAL INVENTORY

Subject: Chemical Industry; Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains information on approximately 56,000 chemical substances in commerce in the U.S., covered in the Toxic Substances Control Act (TSCA) Initial Inventory published June 1, 1979. Each record, providing information on one substance, includes the Chemical Abstracts Service (CAS) Registry Number, preferred name, molecular formula, and synonyms. Synonyms in the records are only those received in the inventory reports; additional synonyms provided in the corresponding printed version are not included. Confidential substances and definitions of complex substances are also excluded.

Time Span: Inventory current as of May 1, 1983
Updating: Irregularly
Producer: **U.S. EPA**
Online Service: DIALOG

TSCA 8(a) LEVEL A INFORMATION SYSTEM (LEVEL8(A))

Subject:	Chemical Use and Exposure
Type:	Non-bibliographic
Content:	

The Preliminary Assessment Information Rule (PAIR), under section 8(A) of TSCA, requires chemical manufacturers to submit general use and exposure data to **EPA** on approximately 250 chemicals. The information submitted includes data on the quantities of chemicals manufactured, amounts directed to certain classes of use, and potential exposures and environmental releases associated with the manufacturing or processing of the chemicals. The LEVEL8(A) Information System contains these data collected under the PAIR.

Holder:	Office of Toxic Substances
Responsible Person:	Maureen Guild
FTS Phone:	8-382-3623

TSCA PLUS

Subject:	Chemical Identification, Manufacturing, and Use
Type:	Non-bibliographic
Content:	

This data base lists chemicals in the TSCA initial inventory of 1976, plus additions as of 1981, and includes plant and production data exclusive to SDC Information Services. The chemical records in the data base include molecular formula, registry number, chemical name, synonyms, and data on manufacturers, amount produced and used. Name, contact person, address, and number of substance producers are also included.

Time Span:	1976-present
Updating:	Continuously
Producer:	Office of the Toxic Substances
Online Service:	SDC Information Services

TSCA TEST SUBMISSIONS (TSCATS)

Subject:	Chemical Test Results
Type:	Chemical Indexing
Content:	

The TSCATS data base represents a compilation of testing data gathered by **EPA** from chemical manufacturers and processors. It is designed to provide indexing terms and descriptors that will enable users to conduct focused searches of industry submissions under TSCA. Each record in the data base contains essential chemical tracking information (document number, title, microfiche number, TSCA section code, CAS number), and descriptors for subject category (health effects, environmental effects, environmental fate) and various aspects of the experimental design (study type, subject organism/test system, route of exposure, and test substance). The system documents approximately 1500 tests for 1232 chemicals.

Holder:	Office of Toxic Substances, Information Management Division
Responsible Person:	Doug Sellers
FTS Phone:	8-382-2320

TSDF

see AIR EMISSIONS FROM TREATMENT STORAGE AND DISPOSAL FACILITIES FOR HAZARDOUS WASTE

WHOLE-BODY COUNT AND BIOASSAY (WBC)

Subject:	Radionuclide Intake by Humans
Type:	Non-bibliographic
Content:	

This data base, which is under development, will hold data on ingested and inhaled radionuclide levels in humans (radiation workers and the general public) relative to Nevada Test Site operations and laboratory activities. These data have been collected since 1963 and are being extracted from reports, internal memoranda, monitoring logs, and raw data. Mobilized whole body counters are being developed for future data collection in the field.

Holder:	Office of Monitoring Systems and Quality Assurance
Responsible Person:	Anita Mullen
FTS Phone:	8-545-2597

3.2 NON-EPA DATA BASES

The following are automated **non-EPA** data bases. Some of the data bases below were identified through personal interviews with **EPA** and **non-EPA** employees. Most of the data bases, however, were selected from other data base directories[6] because of their apparent usefulness in performing risk assessments. The information on each data base was taken directly from these other directories, which should be consulted for further information on these and other data bases.

ACS JOURNALS ONLINE

Subject: Chemistry Journals
Type: Full Text
Content:

This data base contains over 50,000 articles (full text) from 18 journals published by the American Chemical Society. The journals covered are: (1) *Accounts of Chemical Research* , (2) *Analytical Chemistry* (only research papers), (3) *Biochemistry* , (4) *Chemical Reviews,* (5) *Environmental Science and Technology* (1982-present, only research papers), (6) *Inorganic Chemistry,* (7) *Journal of Agricultural and Food Chemistry*, (8) *Journal of the American Chemical Society* (July 1980-present), (9) *Journal of Chemistry and Engineering Data*, (10) *Journal of Chemical Information and Computer Science*, (11) *Journal of Medicinal Chemistry* (1976 present), (12) *Journal of Physical Chemistry* , (13) *Langmuir* (1985-present), (14) *Macromolecules*, and (15)*Organometallics*. (1982-present). For the Journal of The American Chemical Society, Journal of Organic Chemistry, Inorganic Chemistry, and Organometallics, the Registry Numbers assigned by Chemical Abstracts Service are included.

Producer: American Chemical Society
Online Service: Bibliographic Retrieval System (BRS)

AGRICOLA

Subject: Agriculture, Food Sciences and Nutrition
Type: Reference (Bibliographic)
Content:

This data base contains citations to government reports, monographs, journal literature, serials, etc., in agriculture and other related areas. This information has been acquired by The National Agricultural Library for use by The U.S. Department of Agriculture. Covered topics include animal sciences, chemistry and engineering, food and human nutrition, forestry, natural resources, pesticides, soils and fertilizers, water resources, and impact of chemicals in living organisms.

Time Span: 1970-present
Updating: Approximately 12,000 records/month
Producer: U.S. Department of Agriculture, National Agriculture Library
Online Service: Bibliographic Retrieval System (BRS) and DIALOG

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[6] Cuadra Associates, Inc. 1985. *Directory of Online Databases,* Volume 6, Number 3. LC Catalog Number 79 54776. Santa Monica, CA. Zaronzny, Sharon and Monica Honer. 1984. *The Federal Data Base Finder, A Directory of Free and Fee-Based Data Bases and Files Available from the Federal Government.* 1984-85 Edition. Information USA, Inc. Potomac, MD.

AIR/WATER POLLUTION REPORT

Subject: Air and Water - Laws and Regulations
Type: Full Text
Content:

This data base contains *Air/Water Pollution Report* (full text), which is a newsletter that covers air and water pollution. It concentrates on environmental laws and regulations, especially on the Clean Air and Clean Water Acts.

Time Span: 1982-present
Updating: Every week
Producer: Business Publishers, Inc.
Online Service: NewsNet, Inc.

AQUALINE

Subject: Environment, Aquatic Sciences
Type: Reference (Bibliographic)
Content:

This data base includes over 87,000 citations, with abstracts, to literature (worldwide) on aspects of waste water, water, and the aquatic environment. Relevant topics are: (1) surface water, (2) waste water treatment, (3) groundwater, (4) water sampling and analysis, (5) groundwater pollution, (6) drinking water quality, (7) sludge utilization and other related topics.

Time Span: 1960-present
Updating: Approximately 550 records/month
Online Service: DIALOG

AQUATIC SCIENCES AND FISHERIES ABSTRACTS (ASFA)

Subject: Aquatic Sciences
Type: Reference (Bibliographic)
Content:

This data base contains citations with abstracts to literature on science, technology, and management of marine, brackish, and freshwater environments. It includes these and related subjects: agriculture; aquatic biology; ecology and ecosystems; environmental studies; fisheries; limnology; marine biology, pollution, and technology; and water pollution.

Time Span: 1978-present
Updating: About 3000 records a month
Producer: Cambridge Scientific Abstracts,
Inter-governmental Oceanographic Commission, United Nations
Online Service: DIALOG, CISTI

BIOSCIENCES INFORMATION SERVICE (BIOSIS)

Subject: Life Sciences
Type: Bibliographic
Content:

BIOSIS contains citations and abstracts from *Biological Abstracts, Biological Abstracts/Reports, Reviews, Meetings*, and *Bioresearch Index*. Together, these publications constitute a major English language service providing comprehensive worldwide coverage of research in the life sciences.

Time Span: 1969-present
Online Service: DIALOG

CANCER LITERATURE (CANCERLIT; formerly CANCERLINE)

Subject:	Cancer
Type:	Bibliographic
Content:	

CANCERLIT contains about 521,000 references dealing with various aspects of cancer. All references have English abstracts. Over 3,500 U.S. and foreign journals, as well as selected monographs, meeting papers, reports, and dissertations are abstracted for inclusion in CANCERLIT.

Time Span:	1963-present
Updating:	Monthly (5,000 additions per month)
Online Service:	National Library of Medicine

CARCINOGENESIS BIOASSAY DATA SYSTEM (CBDS)

Subject:	Toxicology
Type:	Numeric
Content:	

This data base contains data on approximately 600 chemical compounds being tested for toxicity. Data is mostly carcinogenic results of tests on rats exposed to environmental chemicals. Retrievable information includes: specific animal, dose of chemical, animal age, results, organs affected and kinds of tumors. Examples of chemicals tested include compounds in pesticides and over-the-counter drugs. CBDS is searchable in batch mode.

Time Span:	1973-present
Updating:	Monthly
Online Service:	National Institute of Environmental Health Sciences

CAS ONLINE (also known as CA SEARCH)

Subject:	Chemistry
Type:	Reference (Bibliographic)
Content:	

This data base contains citations to literature in chemistry; organic, analytical, physical, applied, macromolecular, biochemical, and chemical engineering. Covers journals, monographs, conference proceedings, and technical reports. Contains bibliographic information and keyword index entries from the printed *Chemical Abstracts*, CAS-assigned subject terms, and Registry Numbers.

Time Span:	1967-present
Updating:	BRS and CISTI about 40,000 records per month; DIALOG, Data-Star, ESA-IRS, JICST, SDC about 19,000 records every two weeks.
Producer:	Chemical Abstracts Service (CAS)
Online Service:	Bibliographic Retrieval System (BRS), CISTI, DIALOG, Systems Development Corporation (SDC)

CHEMICAL ABSTRACTS SERVICE SOURCE INDEX (CASSI)

Subject: Chemistry
Type: Reference (Bibliographic)
Content:

This data base covers scientific and technical literature relevant to chemistry, chemical engineering, and the chemical sciences.

Time Span: 1900-present
Updating: Quarterly
Producer: Chemical Abstracts Service (CAS)
Online Service: Systems Development Corporation (SDC)

CHEMICAL CARCINOGENESIS RESEARCH INFORMATION SYSTEM (CCRIS)

Subject: Toxicology
Type: Reference (Bibliographic); Non-bibliographic (Textual Numeric)
Content:

This data base contains bibliographic references and data extracted from literature on test conditions and results of carcinogenicity, mutagenicity, and tumor production of 882 chemicals. Data sources include environmental surveys, National Institute of Health sponsored studies, and international journals on cancer research.

Time Span: 1971-present
Updating: Two times per year
Producer: U.S. National Institutes of Health
Online Service: Chemical Information System, Inc. (CIS)

CHEMICAL EVALUATION SEARCH AND RETRIEVAL SYSTEM (CESARS)

Subject: Chemical Properties, Environmental Fate, and Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains toxicological data on approximately 195 chemicals. Data items covered include physical and chemical properties, toxicity, carcinogenicity, mutagenicity, teratogenicity, and environmental fate. Data are from literature which are referenced to source documents.

Time Span: 1962-present
Updating: Annually
Producer: Michigan Department of Natural Resources
Online Service: Chemical Information System, Inc (CIS);
Information Consultants, Inc. (ICI)

CHEMICAL EXPOSURE

Subject: Effects of Contaminants on Animals and Humans
Type: Reference (Bibliographic)
Content:

Contains data from journal articles, conferences, and reports. Traces toxic chemicals and other substances to evaluate their effects. Includes information on chemical properties, synonyms, CAS Registry Numbers, formulas, tissue measured, analytical method used, demographics, keywords, systemic names, etc. Has all the information one needs when examining toxicity of various substances and their effects on animals and humans.

Time Span: 1974-present
Updating: Annually
Producer: Oak Ridge National Library, Chemical Effects Information Center
Online Service: DIALOG

CHEMICAL EXPOSURE; CHEMICALS IN HUMAN TISSUES AND FLUIDS

Subject: Toxicology
Type: Reference (Bibliographic); Non-bibliographic (Textual Numeric)
Content:

Contains citations to literature on over 1000 chemicals that have been identified in human biological media and reported effects of metals, pesticides, and other substances on the human body. Each record includes bibliographic information, Chemical Abstracts Service systematic name and Registry Number, chemical properties, formulas, synonyms, tissue levels measured, analytical method used, number and sex of cases, demographic samples, health effects, geographic location, and animal studied.

Time Span: 1974-present
Updating: About 2000 records a year
Producer: Science Applications International Corp.
Online Service: DIALOG, U.S. DOE (RECON)

CHEMICAL INFORMATION SYSTEM (CIS)

Subject: Chemistry
Type: Reference (Bibliographic)
Content:

This data base provides cross-reference to all citations of a chemical or class of chemicals cited in the Federal Register (FR) since January 1, 1978. Each mention of a substance in the Register results in a citation in the data base, with a description of the FR article as it concerns the cited substance or substances, the agency or agencies involved, the actions being taken or proposed, significant dates, and the affected sections of the CFR (Code of Federal Regulations).

Time Span: 1978-present
Updating: Continuously
Producer: NIH/EPA Chemical Information System User Support
Computer Sciences Corporation
Online Service: Chemical Information System, Inc.

CHEMICAL REGULATIONS AND GUIDELINES SYSTEM (CRGS)

Subject: Chemical Regulations
Type: Reference (Bibliographic)
Content:

This data base provides an index to U.S. Federal regulatory material on the control of chemical substances and covers federal statutes, promulgated regulations, available federal guidelines, standards, and support documents. CRGS follows the regulatory cycle and includes an up-to-date reference to each document, including main documents and revisions published in the *Federal Register*. Each chemical cited in a regulatory document is indexed by name, CAS Registry Number, and a chemical role tag. The latter shows the context in which the substances appear in the document. Citations show publication title, date, abstract, index terms and chemical identifiers.

Time Span: May 1981-present
Updating: Monthly
Producer: CRC Systems, Inc.
Online Service: DIALOG

CHEMICAL REGULATION REPORTER

Subject: Current Developments in Chemical Industry and Regulation
Type: Full Text
Content:

Contains full text of the current developments section of Chemical Regulation Reporter, covering legislative, regulatory, and industry activities related to control of chemicals in the air, water, land, and workplace. Includes control of pesticides, chemical testing, transportation of hazardous materials, waste disposal, and recordkeeping. Primary source is the U.S. Environmental Protection Agency.

Time Span: 1982-present
Updating: Weekly
Producer: Bureau of National Affairs
Online Service: Mead Data Central

CHEMLAW

Subject: Chemical Regulations
Type: Reference (Bibliographic)
Content:

This data base covers U.S. agencies' regulations relating to the manufacture, storage, use, transportation and disposal of chemical substances. Available with summaries, CFR title headings, CFR citations, promulgating agency and statutory authority.

Producer: The Bureau of National Affairs, Inc.
Online Service: DIALOG

CHEMLINE

Subject: Chemical Dictionary
Type: Source (Numeric)
Content:

Contains over 500,000 records on chemical substances found in the following data bases: TOXLINE; TOXBACK 65; TOXBACK 74; MEDLINE; and TDB data bases; also, the **EPA** Toxic Substances Control Act Inventory. Also contains National Library of Medicine file locator and limited ring information. This data base helps the user in searching the other MEDLARS data base by providing synonyms and CAS Registry Numbers, the use of which can increase retrieval in those data bases. CHEMLINE can also be searched to locate classes of chemical substances.

Time Span: 1965-present
Producer: U.S. National Institutes of Health, National Cancer Institute, International Cancer Research Data Bank Program
Online Service: National Library of Medicine, DIALOG (CHEMLINE is under the name CHEMNAME in DIALOG), SDC Information Service (CHEMLINE is under the name CHEMDEX in SDC)

CHEMSEARCH

Subject: Chemistry-Structure & Nomenclature
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains nomenclature information by substances not yet entered in CHEMSIS that have appeared in the most recent 3 updates of CA SEARCH. Elements of data include CAS Registry Number, molecular formula, and systematic names from the Chemical Abstracts Substance Index.

Time Span: Most recent 3 updates of CA SEARCH
Updating: Every 2 weeks
Online Service: DIALOG

CHEM SINGLY INDEXED SUBSTANCES (CHEMSIS)

Subject: Chemistry-Structure & Nomenclature
Type: Non-bibliographic (Textual-Numeric)
Content:

This data base includes CAS Registry Number, molecular formula, systematic names from the Chemical Abstracts Substance Index, synonyms, and ring data. Additional search terms generated by DIALOG for this database are also included.

Time Span: 1967-present
Updating: Current collective index period, irregularly; earlier periods, not updated.
Online Service: DIALOG

CHEMTRAN

Subject: Chemistry-Properties
Type: Non-bibliographic (Textual-Numeric)
Content:

Is a component of a process simulation system that combines data on physical properties of compounds and constants with the software necessary to perform vapor liquid equilibrium calculations. Data on 857 compounds cover molecular weight, normal boiling points, critical properties, ideal gas heat capacities, acentric factors, solubility parameters, liquid density, vapor pressures, and heats of vaporization. The user may also supply a 2 dimensional chemical structure for any compound not in the file and the system will estimate the physical properties of that compound.

Updating: Monthly
Online Service: ChemShare Corporation; Control Data Corporation;
General Electric Information Services Company

CHEMZERO

Subject: Chemistry-Structure & Nomenclature
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains nomenclature information for over I million chemical substances that are not cited in Chemical Abstracts. The following data items from the Registry Nomenclature and Structure Service are included: CAS Registry Number, molecular formula, systematic names from the Chemical Abstracts Substance Index, and synonyms. Additional search terms generated by DIALOG for this database are also included.

Time Span: 1965-present
Updating: Irregularly
Online Service: DIALOG

CLEARINGHOUSE ON HEALTH INDEXES

Subject: Health
Type: Reference (Bibliographic)
Content:

This data base contains citations and abstracts of literature about health indexes. The system includes both published and unpublished materials in a variety of languages; book reviews; information about forthcoming conferences, meetings, seminars, etc., relating to the development and/or application of health measures; and a bulletin board file with information pertaining to the development of health indexes such as forthcoming books, libraries, and technical information centers. "Health indexes" refers to the overall health of an individual or group, and concerns measures of health, not disease. Examples of topics covered include: number of cancer deaths, life expectancy, quality of life, and biometry. The data base contains multidisciplinary materials in fields such as sociology, psychology, economics and political science.

Time Span: 1973-present
Updating: Continuously
Online Service: Department of Health and Human Services
Office of Analysis and Epidemiology

CLINICAL TOXICOLOGY OF COMMERCIAL PRODUCTS (CTCP)

Subject: Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

A database system that contains chemical and toxicological information on over 20,000 commercial products derived from 3000 chemicals. Records can be retrieved by manufacturer, trade name, manufacturer's approved usage, date of most recent change in chemical formulation, chemical names of ingredients, and Chemical Abstracts Service Registry Number. Includes data on toxicity, symptoms, and treatments.

Time Span: 1984
Updating: Data from monthly bulletins added quarterly;
is completely replaced with each new edition.
Producer: **U.S. EPA**; U.S. Food and Drug Admin., U.S. National Institutes of Health
Online Service: Chemical Information System, Inc. (CIS)

COMPLIANCE ALERT: FEDERAL REGISTER DIGEST

Subject: Energy; Environment; Government-U.S. Federal; Safety
Type: Reference (Bibliographic)
Content:

Contains summaries of federal regulations pertaining to the environment, waste management, energy, and the Occupational Safety and Health Administration (OSHA). Covers relevant sections of the Federal Register and the Code of Federal Regulations.

Time Span: 1984-present
Updating: Weekly
Producer: Bureau of Law & Business, Inc.
Online Service: CompuServe Consumer Information Service; NewsNet, Inc.

COMPLIANCE MANAGEMENT REPORT

Subject: Compliance with Environmental and Safety Requirements
Type: Full Text
Content:

Contains full text of *Compliance Management Report*, a newsletter on legal and practical problems encountered in complying with federal laws and regulations in the environmental protection and occupational health and safety areas. Covers air pollution, hazardous materials and wastes, and technologies supporting compliance with regulations.

Time Span: 1984-present
Updating: Monthly
Producer: Bureau of Law & Business, Inc.
Online Service: NewsNet, Inc.

DARC

Subject: Chemical Structure
Type: Search System
Content:

DARC is an integrated chemical search system which operates on the (1) almost seven million chemical compounds in the Chemical Abstracts Service; (2) the almost four million compounds in the Index Chemicals Online file; and (3) the 40,000 compounds and 40,000 complete low resolution mass spectra in the SPECTRA file (NIH-EPA Mass Spectra Data Center). Searching is done on structures, substructures, and Markush Formulae.

Time Span: 1965-present
Updating: Monthly (depends on specific file)
Online Service: Questel, Inc.

DMS

Subject: Hydrologic and Water Quality Data
Type: Non-bibliographic (Numeric)
Content:

Contains hydrologic and water quality data collected from field work and laboratory tests by the U.S. Geological Survey, National Oceanic and Atmospheric Administration, and Environmental Protection Agency. Software systems allow users to analyze time series data, land segments hydrologic response, wash-off and routing in channels and reservoirs, and momentum equations.

Online Service: Hydrocomp, Inc.

DORTMUND VLE DATA BANK

Subject: Chemistry-Properties
Type: Non-bibliographic (Numeric)
Content:

Contains over 10,000 sets of vapor-liquid equilibrium data for approximately 1200 chemicals. Each set of data contains either isobaric or isothermal data for binary, ternary, or quarternary systems. Sources of data include over 2400 technical journal articles and dissertations.

Time Span: 1890-present
Updating: Twice a year
Producer: University of Dortmund
Online Service: ChemShare Corporation

EMBASE

Subject: Human Medicine
Type: Bibliographic
Content:

EMBASE provides bibliographic references and abstracts for literature on human medicine and related disciplines. Subject coverage includes the basic biological sciences with some relevance to human medicine, such as articles on drugs and potential drugs. Normally excluded are articles on nursing, dentistry, psychology, paramedical professions, podiatry, and optometry.

Time Span: 1974-present
Updating: 235,000 records added annually
Online Service: DIALOG

ENVIROLINE

Subject: Environment
Type: Reference (Bibliographic)
Content:

Contains citations to a broad range of issues and topics related to the environment and the management and use of natural resources. Major topic areas included are air, water, and noise pollution; management of renewable and non-renewable resources of the land and water; chemicals, and biological and radiological contaminants. Covers all types of printed literature, including conference papers, research reports, government documents, and journal articles.

Time Span: 1971-present
Updating: About 600 records a month
Online Service: DIALOG

ENVIRONMENT REPORTER

Subject: Current Developments in Environmental Management
Type: Source (Full Text)
Content:

Contains full text of the current developments section of Environment Reporter, covering state and federal legislative, regulatory, and judicial activities related to pollution control and the environment. Includes developments concerning air and water pollution, hazardous wastes, solid wastes, mining, land use, and sewage treatment.

Time Span: 1982-present
Updating: Weekly
Producer: The Bureau of National Affairs, Inc.
Online Service: Mead Data Central

ENVIRONMENTAL BIBLIOGRAPHY

Subject: General Environmental References
Type: Reference (Bibliographic)
Content:

Contains citations to literature on the environment, including water, air, soil, and noise pollution, solid waste management, health hazards, urban planning and other related topics.

Time Span: 1973-present
Updating: About 4000 records every 2 months
Online Service: DIALOG

ENVIRONMENTAL FATE DATA BASES

Subject:	Chemistry-Properties; Environment; Toxicology
Type:	Reference (Bibliographic); Non-bibliographic (Textual Numeric)
Content:	

Consists of 3 interrelated files of information on the fate (i.e., transport and degradation) of organic chemicals released in the environment.

DATALOG. Contains over 48,000 records covering over 4000 organic chemicals and metals. Each record provides the chemical name, molecular formula, Chemical Abstracts Service (CAS) Registry Number, and one or more of 18 data items relevant to the environmental fate of the chemical (e.g., water solubility, octanol/water partition coefficient, vapor pressure, soil adsorption, Henry's Law constant, biodegradation, hydrolysis). Each record also contains an abbreviated reference to the source article.

CHEMFATE. Contains actual data derived from the literature pertinent to the fate of over 465 representative chemicals listed in DATALOG. Categories of data include chemical identification information (e.g., molecular formula, molecular weight, chemical name, synonyms); chemodynamic properties (e.g., log octanol/water partition coefficient, log acid dissociation constant, soil adsorption, ultra-violet absorption, vapor pressure, solubility in water); transport properties (e.g., bioconcentration, evaporation from water, Henry's Law constant, soil column transport); laboratory degradation data; and environmental measurements (e.g., air, biota, water and soil monitoring, and data from field studies). Each record also includes the CAS Registry Number, data type, reference to the source article, and a summary of experimental design, methods, and results.

BIOLOG. Contains citations to literature on microbial degradation and toxicity. Records are organized by CAS Registry Number and by 6 categories.

Updating:	Periodically, as new data become available
Producer:	Syracuse Research Corporation
Online Service:	Syracuse Research Corporation

ENVIRONMENTAL HEALTH NEWS

Subject:	Environment
Type:	Reference (Bibliographic)
Content:	

The data base is not a bibliographic or abstracting service, but rather an environmental news alert. News stories appear weekly in the data bank, totalling approximately 15 new headlines each week. Events covered include committee recommendations, activities, state and local actions, regulatory testing requirements, agency personnel changes and court rulings.

Time Span:	December 1981-present
Updating:	Continuously
Producer:	Occupational Health Services, Inc.
Online Service:	Occupational Health Services, Inc.

ENVIRONMENTAL MUTAGEN INFORMATION CENTER (EMIC)

Subject: Genetic toxicology of chemicals
Type: Bibliographic
Content:

Includes references indexed from journals, magazines, and professional presentations throughout the world. Contains approximately 60,000 references.

Time Span: 1968-present
Updating: Monthly
Online Service: National Library of Medicine

ENVIRONMENTAL TERETOLOGY INFORMATION CENTER (ETIC)

Subject: Valuative of Chemical Physical-Biological Agents for Teratogenicity Activity
Type: Bibliographic
Content:

Includes over 40,000 references pertaining to the biochemical agents for teretology.

Time Span: 1950-present
Updating: Monthly
Online Service: National Library of Medicine

HAZARDOUS SUBSTANCES DATA BANK (HSDB)

Subject: Chemical Data
Type: Non-bibliographic (Textual-Numeric)
Content:

This data base contains data on more than 4100 substances that are of known or potential toxicity and to which substantial populations are exposed. Covers environmental health, standards, and regulations, monitoring and analysis, and safety and handling.

Producer: National Library of Medicine
Online Service: National Library of Medicine

HAZARDLINE

Subject: Chemistry-Properties; Environment; Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains regulatory, health, and precautionary data on over 75,000 hazardous chemicals. Includes chemical name; chemical formula; synonyms, including brand and trade names; Chemical Abstracts Service (CAS) Registry Number; identification number from the Registry of Toxic Effects of Chemical Substances (see RTECS); U.S. Department of Transportation (DOT) UN/PLACARD number; U.S. Environmental Protection Agency **(EPA)** hazardous waste number; a physical description of the substance; chemical and physical properties; incompatibility with other chemical substances; emergency procedures in the event of personal contact; route of entry of the substance into the body; permissible exposure levels, including carcinogenic, mutagenic, and teratogenic data, CERCLA Hazard Ratings, **EPA** reportable quantities, Food and Drug Administration (FDA) acceptable daily intake and food tolerances; level of danger to life or health; relevant federal regulations and abstracts of state laws on hazardous materials, transportation, storage, and state right-to-know laws; and guidelines and procedures for dealing with hazardous leaks, spills, and waste disposal. Users can retrieve data on specific chemical substances by searching on various criteria, including chemical name, synonym, keyword, chemical formula, CAS Registry Number, RTECS number, or symptoms of exposure. Sources of data include (OSHA) and **EPA** standards and regulations, as well as National Institute of Occupational Safety and Health (NIOSH) criteria documents.

Updating:	Most services, daily; Mead Data Central, quarterly
Producer:	Occupational Health Services, Inc.
Online Service:	Bibliographic Retrieval System (BRS); Executive TelecomSystem, Inc.; Mead Data Central

HEILBRON

Subject:	Chemistry-Properties
Type:	Non-bibliographic (Textual-Numeric)
Content:	

Contains physical and chemical properties data on approximately 70,000 important substances selected by a panel of experts. Includes molecular weight and formula; melting, freezing, and boiling point; solubility; relative density; optical rotation; dissociation constants; and Chemical Abstracts Service Registry Number, derivative names, synonyms, and variant compounds.

Time Span:	Current information
Updating:	Every 6 months
Online Service:	DIALOG

INSTRUCTIONAL RESOURCES INFORMATION SYSTEM (IRIS)

Subject:	Educational Materials and Institutions Concerning Water Resources
Type:	Reference (Bibliographic, Referral)
Content:	

Contains citations, with abstracts, to educational and instructional materials (both print and non-print) on water quality and water resources. Topics covered include water quality, water resources, water pollution control, water treatment, waste disposal, wastewater treatment, water quality monitoring, safety, standards, pesticides and toxic substances.

Time Span:	1979-present
Updating:	About 1300 records a year
Online Service:	CompuServe Consumer Information Service

LEXIS

Subject:	Court Cases and Actions
Type:	Full-Text
Content:	

LEXIS contains the full-text court decisions for complete legal cases and relevant text from a few pending cases. The court cases included in LEXIS are from both federal and local levels taking place in the entire U.S. as well as internationally (court cases from Great Britain and France are included). In addition to court case actions, LEXIS contains the full text of other legal-related non-case law material including college law reviews, Commerce Clearinghouse Materials, American Bar Association publications, and publications from the Bureau of National Affairs.

Time Span:	State court cases are from approximately 1976 to present; federal court cases are from the 1800's to present. An effort is under way to include court cases dating back to the mid 1700's.
Updating:	As court cases are decided
Online Service:	Mead Data Central

LOG P DATABASE

Subject: Chemistry-Properties
Type: Non-bibliographic (Numeric)
Content:

Contains about 27,500 records providing partition coefficients (log P values) and related data for over 13,000 organic compounds in about 300 solvents. Includes compound name, log P value, Chemical Abstracts Service Registry Number, molecular formula, chemical name, Wiswesser Line Notation (WLN), Acid Dissociation Constant (PKA), and citations to source documents. Data can be used to predict properties (e.g., absorption, solubility) and interactions of substances in chemical and biological procedures and processes.

Time Span: 1965 to date
Updating: About 1250 records twice a year
Producer: Pomana College Medical Chemistry Project
Online Service: Technical Database Services, Inc.

MASTER WATER DATA INDEX (MWDI)

Subject: Aquatic Sciences
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains about 500,000 sites throughout the U.S. from which water data (both surface and ground) is collected. Site information includes: location, organization collecting information, status of collection project and water quality parameter data. The data base can be searched by geographical area, type of site, and longitude/latitude position.

Time Span: 1976-present
Online Service: U.S. Geological Survey NAWDEX Program Office

MEDLINE

Subject: Medical
Type: Bibliographic
Content:

MEDLINE contains approximately 600,000 references to biomedical journal articles published in the current and two preceeding years. An English abstract, if published with the article, is frequently included. The articles are from 3,000 journals published in the U.S and to foreign countries, as well as from selected monographs.

Time Span: 1966-present
Updating: Monthly
Online Service: National Library of Medicine

NATIONAL ENVIRONMENTAL DATA REFERRAL SERVICE (NEDRES)

Subject: Environment; Information Systems & Services Directories
Type: Reference (Bibliographic, Referral)
Content:

Contains over 13,000 descriptions of sources of publicly available environmental data, collected by environmental satellites, oceanographic vessels, weather stations, bouy, and environmental observers. Type of data sources covered include computer readable data files, printed publications, data file documentation (e.g., manuals, code book), and organizations that provide environmental data. Covers climatological, meteorological, oceanographic, geophysical, geological, geographic, hydrological and limnological data. Each record includes title or name of data source; descriptions of purpose and general characteristics of the data; data collection methods; data processing and quality control; time period; geographic area; names of observed or computed parameters and variables; general descriptors such as chemical compound and biological organism names; availability of data (e.g., contact person or organization and volume, media, and conditions of use); principal investigator(s); program, project name or acronyms, and contract or grant; processing organization (if different from contact); related publications; and discipline, type, and organization codes.

Time Span:	1974-present
Updating:	Quarterly
Producer:	National Oceanic and Atmospheric Administration, National Environmental Data Referral Service
Online Service:	Bibliographic Retrieval System (BRS)

NATIONAL GROUNDWATER INFORMATION CENTER DATA BASE (NGWIC)

Subject:	Ground and Surface Water Use
Type:	Bibliographic
Content:	

The NGWIC data base contains references on the occurrence and utilization of surface and ground water, and on water well technology. Indexed titles include trade and technical journals and newsletters, books, and government documents. Because **EPA** established the National Groundwater Information Center, there is special emphasis in the data base on **EPA**-sponsored reports.

Time Span:	Depends on the journal; some since 1890
Updating:	Monthly
Online Service:	National Water Well Association

NATIONAL OCCUPATIONAL EXPOSURE SURVEY (NOES)

Subject:	Exposure Assessment
Type:	Non-bibliographic
Content:	

The content of this information resource is the same as the NOHS data base described immediately below, except NOES covers the time frame 1981- 1983 and NOHS covers 1970 - 1974.

Time Span:	1981-1983
Online Service:	David Sundin, National Institute for Occupational Safety and Health (513) 684-4491

NATIONAL OCCUPATIONAL HAZARD SURVEY (NOHS)

Subject:	Exposure Assessment
Type:	Non-bibliographic
Content:	

The content of this data base, available on printout, lists either industries or occupations for which the NOHS indicated a potential exposure to the listed agents. The survey data were collected during the period 1972 to 1974 from a sample of 4,636 businesses employing nearly 900,000 workers. Exposure estimates were derived based on observed uses of a specific agent, and observed uses of a product known or suspected to contain an agent.

Time Span:	1970-1974
Online Service:	David Sundin, National Institute for Occupational Safety and Health, (513) 684-4491

NATIONAL PESTICIDE INFORMATION RETRIEVAL SYSTEM (NPIRS)

Subject: Pesticide Chemical and Registration Data
Type: Non-bibliographic
Content:

This data base contains information that describes the key characteristics of pesticides. Included are approximately 50,000 products registered by the **EPA** as well as thousands of state registrations. One valuable source of information about pesticides that is available on-line through NPIRS is the Pesticide Fact Sheets. These fact sheets are prepared as new pesticides are first registered, or as registration standards or special reviews are completed for old pesticides. Each fact sheet summarizes the following characteristics of a pesticide chemical: chemical description and characteristics; use patterns and formulations; toxicological characteristics; physiological and behavioral characteristics; environmental fate and effects; groundwater concerns; food residue tolerances; reported incidents; **EPA's** regulatory position and supporting rationale; and major gaps in the supporting data base.

Producer: Purdue University
Time Span: 1982-present
Updating: Weekly
Online Service: Martin Marietta Data Systems

NATIONAL TECHNICAL INFORMATION SERVICE (NTIS)

Subject: Science & Technology
Type: Reference (Bibliographic)
Content:

Contains over 1 million citations, most with abstracts, to unrestricted technical reports from U.S. and non U.S. government-sponsored research, development, and engineering analyses. The unpublished U.S. reports are prepared by federal, state, and local agencies and their contractors or grantees. Major areas covered include the biological, social, and physical sciences, mathematics, engineering, and business information. Includes announcements of computer-readable software and data files, U.S. Government-owned inventions, selected reprints, federally sponsored translations, and some non-English language reports.

Time Span: 1974-present
Updating: About 5000 records a month
Online Service: Bibliographic Retrieval System (BRS); CISTI; DIALOG;
Mead Data Central; Systems Development Corporation (SDC)
Information Services: TECH DATA (a special BRS)

NEXIS

Subject: Business News
Type: Full Text
Content:

NEXIS is a full-text data base containing current business news from printed sources such as magazines (e.g., *Business Week*), newspapers (e.g., the *New York Times* and *Washington Post*), newsletters, and government documents.

Time Span: Generally from 1975 to present, but this may vary for particular publications
Updating: Daily or weekly depending on the timing of different publications
Online Service: Mead Data Central

NIOSHTIC

Subject: Toxicology
Type: Reference (Bibliographic)
Content:

Contains more than 100,000 bibliographic citations and abstracts of occupational safety and health materials pertaining mainly to toxicology. Input is gathered from U.S. and foreign literature, the personnel files of several distinguished people in the fields, and foreign trade.

Time Span: 1975-present
Updating: About 500 to 1,000 records a month
Online Service: National Institute of Occupational Safety and Health

OCCUPATIONAL HEALTH SERVICES MATERIAL SAFETY DATA SHEET (OHS-MSDS)

Subject: Chemical and Safety Information
Type: Non-bibliographic (Textual-Numeric)
Content:

This data base contains chemical and safety information required by the Occupational Safety and Health Administration for more than 75,000 substances. Includes substance identification, physical data, fire and explosion data, toxicity and health effects, and spill and leak procedures.

Online Service: Occupational Health Services, Inc.

OSHA COMPUTERIZED INFORMATION SYSTEM (OCIS)

Subject: Industrial Chemicals
Type: Search System
Content:

The system contains 17 separate data bases covering a wide range of subjects. Files include results of laboratory samples, hazardous waste site activities, and industrial activities. Also included in the data bases are references, letters of correspondence between OSHA and industries, and records of industrial chemical activities. Total references are approximately 275,000.

Time Span: 1981-present
Updating: Monthly
Online Service: OSHA Analytical Laboratory

PASCAL

Subject: Physical, Earth, and Life Sciences; Engineering Science
Type: Bibliographic
Content:

PASCAL is a multidisciplinary data base containing over 5 million citations. Subjects include physical science (e.g., atoms and molecules; general physical, analytical, inorganic, and organic chemistry), earth science (e.g., stratigraphy and hydrology), life sciences (e.g., human diseases, genetics, and animal biology), and engineering science (e.g., pollution, mechanical industries, and transportation). PASCAL is a French database, but over 70 percent of the citations are in English.

Time Span: 1973-present
Updating: Approximately 500,000 new citations each year.
Producer: Centre de Documentation Scientifique et Technique
Online Service: Questel, Inc.

POLLUTION ABSTRACTS

Subject: Pollution Research, Sources, and Controls
Type: Reference (Bibliographic)
Content:

Contains citations, with abstracts, to the worldwide technical and non-technical literature on pollution research, sources, and controls. Covers air, water, land, thermal, noise, and radiological pollution; pesticides; sewage and waste treatment; environmental action; and toxicity and health.

Time Span: 1970-present
Updating: Most services, about 1500 records every 2 months; BRS, monthly
Producer: Cambridge Scientific Abstracts
Online Service: Bibliographic Retrieval System (BRS); DIALOG

POPULATION INFORMATION ONLINE (POPLINE)

Subject: Population/Demography
Type: Bibliographic
Content:

POPLINE contains about 147,200 citations and abstracts to journal articles, monographs, and technical reports in the field of population, including basic research in demography.

Time Span: 1970-present
Updating: Monthly
Online Service: National Library of Medicine

PROFILE

Subject: Toxicology
Type: Non-bibliographic
Content:

PROFILE was developed to provide a structured method for abstracting, storing, and retrieving toxicological data. It contains chemicals found in the urban atmosphere, water, coal, and as environmental pollutants; including many organic compounds but less than ten inorganic compounds, pesticides, and metals. PROFILE data records contain information on a total of about 300 chemicals.

Time Span: 1981-present
Updating: Updated as results of new literature searches are completed.
Online Service: Systems Application, Inc.

REGISTRY NOMENCLATURE AND STRUCTURE SERVICE (RNSS)

Subject: Chemistry-Structure & Nomenclature
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains data that are based on the Chemical Abstracts Service (CAS) Registry Nomenclature and Structure Service, an authority file of names and structural data that have been registered by CAS. The coverage and size of the data bases on each online service are somewhat different, but entries have in common the following data items: full nomenclature and synonyms; substructure search via nomenclature; preferred, alternate, replaced, and replacing Registry Numbers; molecular formula; and ring system information. The data bases available through RNSS include:

CHEMDEX. Covers all substances cited in Chemical Abstracts, 1972 to date.

CHEMLINE. Covers substances appearing with a CAS Registry Number in any National Library of Medicine data base or in the Toxic Substances Control Act (TSCA) Inventory of the U.S. Environmental Protection Agency. Each entry contains the information listed above, as well as locators pointing to the data bases in which the substance is referenced.

CHEMNAME. Covers substances that have been cited 2 or more times in Chemical Abstracts, from 1967 to date. Additional search terms generated by DIALOG specifically for CHEMNAME are also included.

CHEMICAL NOMENCLATURE. Covers all substances cited in Chemical Abstracts from 1967 to date.

REGISTRY OF TOXIC EFFECTS OF CHEMICAL SUBSTANCES (RTECS)

Subject: Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains over 110,000 unevaluated toxicological measurements pertaining to approximately 73,000 chemicals. Each entry contains the Chemical Abstracts Service (CAS) name and registry number, synonyms, molecular formula, and one or more measures of toxicity, including acute and chronic in-vivo data, in-vitro mutagenesis data, and skin and eye irritation data.

Updating: Quarterly
Producer: U.S. Dept. of Health and Human Services, National Institute for Occupational Safety and Health
Online Service: Chemical Information System, Inc., (CIS)

SOILS INFORMATION RETRIEVAL SYSTEMS (SIRS)

Subject: Soil Characteristics
Type: Reference (Bibliographic); Non-bibliographic (Textual Numeric)
Content:

Contains 20,000 records compiled from the Soil Conservation Service's reports on the characteristics and interpretive properties of all soils in the United States. Examples of soil information include use restrictions, potential habitat, description of soil and much more. Information is organized only by soil series.

Updating: About 4000 revisions a month
Online Service: ETIS

STRUCTURE AND NOMENCLATURE SEARCH SYSTEM (SANSS)

Subject: Chemical Properties
Type: Indexing System
Content:

SANSS is a component of the NIH/EPA Chemical Information System (CIS), and serves as an index to most of the other CIS components as well to over 100 other important sources of information on environmentally significant chemicals. These sources include EPA reports, state documents, and international lists. Included for each chemical are names, synonyms, molecular formulas, and structural images.

Online Service: Chemical Information System (CiS), Information Sciences Corporation

TOXICOLOGY DATA BANK

Subject: Toxicology
Type: Non-bibliographic (Textual-Numeric)
Content:

Contains data on more than 4,100 substances that are of known or potential toxicity and to which substantial populations are exposed. Approximately 96 data elements are grouped into several classes of information, including:

Substance Identification Information. Includes Chemical Abstracts Service Name and Registry Number, synonyms, and molecular formula. Manufacturing/Use Information. Includes probable method of manufacture, manufacturers, major uses, and production data. Chemical and Physical Properties. Includes boiling point, melting point, and solubility.

Manufacturing/Use Information. Includes probable method of manufacture, manufacturers, major uses, and production data.

Chemical and Physical Properties. Includes boiling point, melting point and solubility.

Toxicity/Biomedical Effects. Includes human and non-human toxicity, minimum fatal dose, antidote and emergency treatment, and pharmacokinetics.

Environmental Fate/Exposure Potential Information. Includes average daily intake, probable routes of human exposure, and body burden.

Monitoring and Analysis Methods. Includes sampling procedures, analytic procedures, and clinical laboratory methods.

Additional references. Includes special reports and test status. Information has been extracted from the published literature and reviewed by subject specialists before being entered into the database. The sources used are listed in the record so that users can obtain more detailed information from these original sources.

Updating:	About 200 new and revised records a quarter
Producer:	National Library of Medicine
Online Service:	National Library of Medicine

TOXLINE

Subject:	Biomedicine; Pesticides; Toxicology
Type:	Reference (Bibliographic)
Content:	

Contains citations, with abstracts, to the literature in all areas of toxicology, including chemicals and pharmaceuticals, pesticides, environmental pollutants and mutagens, and teratology. Comprises discrete files.

Abstracts On Health Effects Of Environmental Pollutants (HEEP). Contains records from the BIOSIS PREVIEWS database. Covers effects of environmental chemicals or substances, other than medicinals, on human health.

Chemical-Biological Activities (CBAC). Contains records from Chemical Abstracts that cover interactions of chemical substances with biological systems in-vivo and in-vitro. All records contain CAS registry numbers.

Hayes File On Pesticides. Contains citations to published articles on health aspects of pesticides. Is essentially a backfile for Pesticides Abstracts (see below). Does not include abstracts (1940-1968).

Hazardous Materials Technical Center Bulletin (HMTC). Contains citations to published literature on the management of hazardous materials, including disposal, storage, and transportation.

Pesticides Abstracts. Corresponds to a publication, formerly known as Health Aspects of Pesticide Abstract Bulletin (HAPAB), prepared on the epidemiological effects of pesticides on humans, from more than 1000 journals published in the U.S. and other countries.

Toxic Materials Information Center File (TMIC). Contains citations and abstracts on toxic materials prepared by the TMIC. Oak Ridge National Laboratory (1940 to 1973).

Toxicity Bibliography. Is a subset of the MEDLINE database. Covers adverse effects, toxicity, or poisoning caused by drugs and chemicals, as well as disease conditions induced by chemical substances. All records contain Chemical Abstracts Service Registry Numbers (1965 to date).

Toxicology/Epidemiology Research Projects (RPROJ). Contains descriptions of research projects supported by research grants and contracts programs of the Public Health Service, or conducted intramurally by the U.S. National Institutes of Health (NIH) and the National Institute of Mental Health in the areas of toxicology and epidemiology.

Toxicology Document and Data Depository (TD3). Contains citations to the report literature dealing with toxicology and related subjects. Information is obtained from the NTIS database (1979 to date).

Time Span: Varies by file
Updating: About 12,000 records a month
Producer: National Library of Medicine
Online Service: National Library of Medicine

WASTE MANAGEMENT AND RESOURCE RECOVERY

Subject: Waste Management; Resource Recovery
Type: Reference (Bibliographic)
Content:

Contains citations, with abstracts, to the worldwide literature covering solid, liquid, hazardous, and nuclear waste management; water quality; toxic substances; land reclamation; and resources recovery. Emphasis in these areas is on air pollution, agricultural engineering, civil engineering, food science, geology, and nuclear science. Sources include government reports, journal articles, monographs, proceedings, news items, patents, and other databases.

Time Span: March 1971-present
Updating: Every 2 weeks, about 30,000 records a year
Online Service: International Research & Evaluation

WATER DATA SOURCES DIRECTORY (WDSD)

Subject: Aquatic Sciences
Type: Reference (Bibliographic)
Content:

Contains information on over 700 organizations that are water data users and collectors. Organizations include consultants, businesses, universities and governmental agencies. Data includes background information on each listing, and the name, address and phone number of a contact person in each organization. WDSD can be searched by geographical area, agency code, or multistate organizations.

Updating: Continuously
Producer: U.S. Geological Survey NAWDEX Program Office

WATER DATA STORAGE AND RETRIEVAL SYSTEM (WATSTORE)

Subject: Aquatic Sciences and Water Resources
Type: Non-bibliographic (Textual-Numeric)
Content:

This database stores the hydrologic data collected by the U.S. Geological Survey at more than 70,000 water sites nationwide. The system consists of several files. The **Station Header File** contains identification, location and physical descriptions of sites for which data is stored. The **Daily Values Files** contains river stages, streamflow values, water temperatures, specific conductance values, sediment concentrations and discharges, and other parameters that are measured on a daily schedule. The **Peak Flow File** contains peak streamflow and stage values for surface water sites. The **Unit Values File** contains stream discharge values, temperatures, and other parameters that are measured on a schedule more frequently than daily. The **Water Quantity File** contains results of chemical, physical, biological and radiochemical analyses for both surface and ground waters. The **Ground-Water Site Inventory File** contains inventory information such as site location and identification data, well-construction data, geohydrologic characteristics, and other data pertinent to wells, springs, and other sources of ground water.

Updating: Frequently
Producer: U.S. Geological Survey Water Data Exchange Office

WATER RESOURCES ABSTRACTS

Subject: Aquatic Sciences; Water Resources
Type: Reference (Bibliographic)
Content:

Contains about 180,000 citations, with abstracts, to scientific and technical literature on the water-resource-related aspects of the physical, social, and life sciences. Also covers related engineering and legal aspects of the characteristics, conservation, control, use, and management of water resources. Topics covered include the nature of water and water cycles; water quality management and protection; and water resources planning.

Time Span: 1968 to date
Updating: About 500 records a month
Producer: U.S. Geological Survey
Online Service: DIALOG; U.S. Department of Energy (RECON)

WATER RESOURCES SCIENTIFIC INFORMATION CENTERS (WRSIC)

Subject: Aquatic Sciences
Type: Reference (Bibliographic)
Content:

Contains 140,000 abstracts, indexes and citations to materials in the following fields: nature of water; resources data; watercycles; engineering works; water supply augmentation and conservation; water quality management, control and protection; manpower, grants and facilities; and scientific and technical information. WRSIC also maintains a data base of information about current water resources projects.

Time Span: 1968-present
Updating: About 10,000 records a month
Online Service: DOE (RECON); DIALOG (File 17)

WATERLINE

Subject: Ground-Water Quality and Quantity
Type: Full Text
Content:

Provides access to a wide variety of information on the quality and quantity of U.S. ground-water resources. Includes full text of relevant state and federal regulations covering ground water leasing and public information brochures on ground water.

Updating: Irregularly
Producer: National Water Well Association
Online Service: CompuServe Consumer Information Service

WATERNET

Subject:	Water Quality
Type:	Reference (Bibliographic)
Content:	

Contains citations, with abstracts, to literature on water quality, analytical procedures for water quality testing, water system materials, and environmental issues related to water. Includes these specific topics: the drinking water industry, water pollution, health effects, toxicology. Items are selected from books, conference proceedings, journals, newsletters, standards, handbooks, water quality standard test methods.

Time Span:	1971-present
Updating:	Quarterly; about 5000 records a year
Producer:	American Water Works Association
Online Service:	DIALOG

WETLAND VALUES BIBLIOGRAPHIC DATABASE

Subject:	Aquatic Sciences; Wetlands
Type:	Reference (Bibliographic)
Content:	

Contains approximately 4000 citations, with abstracts, to literature on functions and values of wetlands in the U.S. Covers food chain, habitat, human use, hydrologic and water quality values, as well as wetland value assessment techniques, and related bibliographies.

Time Span:	1950-present
Updating:	Monthly
Producer:	U.S. Army Corp of Engineers, U.S. Dept. of the Interior
Online Service:	U.S. Department of Energy

3.3 ADDRESSES OF ONLINE SERVICES AND PRODUCERS

This section contains an alphabetical listing of online services and the producers of the data bases described above.

American Water Work Association
Technical Library
6666 West Quincy Avenue, Denver, CO 80235
Telephone: (303) 794-7711
Telex: 45-0895

American Chemical Society
1155 16th Street, N.W., Washington, D.C. 20036
Telephone: (202) 872-8066; (800) 424-6767
Telex: 440159 ACSPUI

Bibliographic Retrieval System (BRS)
1200 Route 7, Latham, NY 12110
Telephone: (518) 783-1161; (800) 227-5277; (800) 553 5566 (N.Y only)
TWX: (710) 444-4965

Bureau of Law and Business, Inc.
64 Wall Street, Madison, CT 06443
Telephone: (203) 245-7448

The Bureau of National Affairs, Inc.
Data Base Publishing Unit
1231 25th Street, NW
Washington, D.C. 20037
Telephone: (202) 452-4132; (800) 862-4636
Telex: 892692

Business Publishers, Inc.
951 Pershing Drive
Silver Spring, MD 20910
Telephone: (301) 587-6300

Cambridge Scientific Abstracts
5161 River Road
Bethesda, MD 20816
Telephone: (301) 951-1400; (800) 638-8076
Telex: 898452 DISCINC BHDA

Chemical Abstracts Service
2540 Olentangy River Road
P.O. Box 3012
Columbus, OH 43210
Telephone: (614) 421-3600; (800) 848-6533
Telex: 6842086 CHMAB
TWX: (810) 482-1608

Chemical Information System, Inc.
Computer Sciences Corporation
P.O. Box 2227
6565 Arlington Blvd.
Falls Church, VA 22046
Telephone: (703) 237-2000

ChemShare Corporation
P.O. Box 1885
Houston, TX 77001
Telephone: (713) 627-8945

CISTI
Client Services CAN/OLE and CAN/SDI
National Research Council Canada
Ottawa, Ontario K1A OS2
Canada
Telephone: (613) 993-1210
Telex: 0533115

CompuServe Consumer Information Service
5000 Arlington Centre Blvd.
Columbus, OH 43220
Telephone: (614) 457-8600; (800) 848-8990

Control Data Corporation
P.O. Box O
Minneapolis, MN 55440
Telephone: (612) 853-8100; (800) 328-1870

DIALOG Information Services, Inc.
3460 Hillview Avenue
Palo Alto, CA 94304
Telephone: (415) 858-3785; (800) 334-2564
Telex: 334499 DIALOG
TWX: (910) 339-9221

EIC/Intelligence Inc.
48 West 38th Street
New York, NY 10018
Telephone: (212) 944-8500; (800) 223-6275
Telex: 668298

Environmental Quality
Instructional Resources Center
The Ohio State University
1200 Chambers Road, Room 310
Columbus, OH 43212
Telephone: (614) 422-6717

Environmental Studies Institute
2074 Alameda Padre Serra
Santa Barbara, CA 93103
Telephone: (805) 965-5010

Executive Information Service
John Wiley & Sons, Inc.
P.O. Box 437
One Wiley Drive
Somerset, NJ 08873
Telephone: (212) 850-6360

Executive Telecom System, Inc.
9585 Valparaiso Court
Indianapolis, IN 46268
Telephone: (317) 872-2045; (800) 421-8884

General Electric Information Services Company
401 North Washington Street
Rockville, MD 20850
Telephone: (301) 340-4000
Telex: 898431

Hydrocomp, Inc.
201 San Antonio Circle
Mountain View, CA 94040
Telephone: (415) 948-3919
Telex: 348357

Information Consultants, Inc.
1133 15th Street, N.W.
Suite 300
Washington, D.C. 20005
Telephone: (202) 822-5200

Information Sciences Corporation
2135 Wisconsin Avenue, N.W.
Washington, D.C. 20007
Telephone: (202) 298-6200

International Research and Evaluation

21098 IRE Control Center
Eagan, MN 55121
Telephone: (612) 888-9635
Telex: 29-1008

Martin Marietta Data Systems
6303 Ivy Lane
Greenbelt, MD 20770
Telephone: (301) 982-6500

Mead Data Central
P.O. Box 933
Dayton, OH 45401
Telephone: (513) 859-1611; (800) 227-4908

National Institute of Environmental Health Sciences
Toxicology Research and Testing Service
MD 18-01, P.O. Box 12233
Research Triangle Park, NC 27709
Telephone: (919) 541-3418

National Institute for Occupational Safety and Health
4676 Columbia Parkway
Cincinnati, OH 45226
Telephone: (513) 684-4491

National Library of Medicine
Toxicology Information Program
8600 Rockville Pike
Bethesda, MD 20209
Telephone: (301) 496-6193

National Technical Information Service
Database Services Division
5285 Port Royal Road
Springfield, VA 22161
Telephone: (703) 487-4807
Telex: 899405

National Water Well Association

500 West Wilson Bridge Road
Worthington, OH 43085
Telephone: (614) 761-1711

NewsNet, Inc.
945 Haverford Road
Bryn Mawr, PA 19010
Telephone: (215) 527-8030; (800) 345-1301

Oak Ridge National Laboratory
Environmental Mutagen Information Center
Building 9224
P.O. Box Y
Oak Ridge, TN 37831
Telephone: (615) 574-7871

Occupational Health Services, Inc.
400 Plaza Drive
P.O. Box 1505
Secaucus, NJ 07094
Telephone: (201) 865-7500; (800) 223-8978
Telex: 4754124

OSHA Analytical Laboratory
P.O. Box 15200
1781 S. 300 West
Salt Lake City, UT 84115
Telephone: FTS-588-4270; (801) 524-4270

Pomona College Medicinal Chemistry Project
Seaver Chemistry Laboratory
Claremont, CA 91711
Telephone: (714) 621-8000

Questel, Inc.
1625 Eye Street, N W.
Suite 719
Washington, D.C. 20006
Telephone: (202) 296-1604; (800) 424-9600

Health and Environmental Information
300 South Tulare Avenue
Oak Ridge, TN 37830
Telephone: (615) 576-6024

Systems Development Corporation (SDC) Information Services
2500 Colorado Avenue
Santa Monica, CA 90406
Telephone: (213) 453-6194; (800) 421-7229; (800) 352 6689 (in CA)
Telex: 652358
TWX: (910) 343-6643

Sigma Data Services Corp.
5515 Security Lane
Rockville, MD 20852
Telephone: (301) 231-0644
Telex: 898435

State of Michigan
Department of Natural Resources
Office of Materials Control
P.O. Box 30028
Lansing, MI 48909
Telephone: (517) 373-2190

STN International
c/o Chemical Abstracts Service
2540 Olentangy River Road
P.O. Box 3012
Columbus, OH 43210
Telephone: (614) 421-3600; (800) 848-6533
Telex: 6842086 CHMAB
TWX: (810) 482-1608

Syracuse Research Corporation
Merrill Lane
Syracuse, NY 13210
Telephone: (315) 425-5100

Technical Database Services, Inc.

10 Columbus Circle, Suite 2300
New York, NY 10019
Telephone: (212) 245-0044
Telex: 238790 NYK

U.S. Army Corps of Engineers
Waterways Experiment Stations
Environmental Lab
P.O. Box 631
Vicksburg, MS 39180
Telephone: (601) 634-3774

U.S. Dept. of Agriculture
National Agriculture Library
Information Systems Division
Room 203
Beltsville, MD 20705
Telephone: (301) 344-3813
TWX: (710) 828-0506 USDA NAL

U.S. Dept. of Energy
Office of Scientific and Technical Information
P.O. Box 62
Oak Ridge, TN 37831

U.S. Dept. of Energy
RECON
P.O. Box 62
Oak Ridge, TN 37830
Telephone: (615) 576-1303

U.S. Dept. of Health and Human Services
Public Health Service
National Institute for Occupational Safety and Health
Registry of Toxic Effects of Chemical Substances
4676 Columbia Parkway
Cincinnati, OH 45226
Telephone: (513) 684-8317

Office of Analysis and Epidemiology
300 East-West Highway, RM 27
Hyattsville, MD 20782
Telephone: (301) 436-7035

U.S. Dept. of the Interior
Geological Survey
Water Resources Scientific Information Center
425 National Center
Reston, VA 22902
Telephone: (703) 860-7455

U.S. Environmental Protection Agency
CIS Project
PM-218
401 M Street, SW
Washington, D.C. 20460

U.S. Environmental Protection Agency
Air Pollution Technical Information Center
Library MD-35
Research Triangle Park, NC 27711
Telephone: (919) 541-2777

U.S. Environmental Protection Agency
Emergency Response Division
401 M Street, SW
Washington, D.C. 20460
Telephone: (202) 382-7933; (800) 368-3432

U.S. Environmental Protection Agency
Office of Pesticides and Toxic Substances
Chemical Information Branch
401 M Street, SW, MS-TS793
Washington, D.C. 20460
Telephone: (202) 382-3524; (800) 424-9065
Telex: 892758

U.S. Food and Drug Administration
200 C Street, SW
Washington, D.C. 20204
U.S. Geological Survey

NAWDEX Program Office and
Water Data Exchange Office
421 National Center
Reston, VA 22092
Telephone: (703) 648-5677

U.S. National Institutes of Health
9000 Rockville Pike
Bethesda, MD 20205
Telephone: (301) 496-4235

3.4 ACCESS TO DATA BASES THROUGH EPA LIBRARIES

Several of the data bases cited in Sections 3.1 and 3.2 may be accessed through the **EPA** Library System, which consists of a total of 28 different libraries located at **EPA** Headquarters, Regional Offices, and Laboratories. Upon request from **EPA** employees, the libraries can perform searches of those data bases for which they have access at no cost to the employee. This section lists which data bases may be searched through each of the **EPA** libraries.[7] In general, it is necessary to contact the office responsible for a particular data base in order to make arrangements for accessing **EPA** data bases. Information in this section is based on results of a survey completed in October, 1985 by **EPA's** Information Management and Services Division, Information Services Branch.

Some of the data bases listed below are individual data bases (e.g., HAZARDLINE) and additional information on each of these is presented in Sections 3.1 or 3.2 under the respective data base names. Other data bases listed below are actually the names of collections of data bases available through **non-EPA** online services (e.g., DIALOG and BRS data bases). An exhaustive list of all the individual data bases making up these various data base collections is not provided in this **Directory.** However, Section 3.2 does provide additional information on some of these individual data bases, which are identified in Section 3.2 as being available through the particular online service of interest.

Athens Environmental Research Laboratory Library

Non-EPA Data Bases (see Section 3.2):

DIALOG Information Services, Inc. Data Bases

Address: College Station Road
Athens, GA 30613
(FTS) 8-250-3324

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[7] Although there are certain **EPA** data bases that may be accessed through **EPA** libraries (e.g., GEMS and PDMS), the libraries primarily provide access to **non-EPA** data bases. In general, it is necessary to contact the office responsible for a particular data base in order to make arrangements for accessing **EPA** data bases.

Central Regional Laboratory Library

Non-EPA Data Bases (see Section 3.2):

NGWIC

Address:
839 Bestgate Road
Annapolis, MD 21401
(FTS) 8-922-3752

Cincinnati Environmental Research Center Library

Non-EPA Data Bases (see Section 3.2):

CAS ONLINE
DIALOG Information Services, Inc. Data Bases
HAZARDLINE
National Library of Medicine Data Bases
NGWIC

Address:
26 West St. Clair Street
Cincinnati, OH 45268
(FTS) 8-684-7701

Note:

The Las Vegas Environmental Monitoring and Support Laboratory Library conducts data base searches through the Cincinnati Library.

Corvallis Environmental Research Laboratory Library

Non-EPA Data Bases (see Section 3.2):

CIS
DIALOG Information Services, Inc. Data Bases
NGWIC
National Library of Medicine Data Bases
U.S. DOE (RECON)

Address:
200 SW 35th Street
Corvallis, OR 97330
(FTS) 8-420-4731

Duluth Environmental Research Laboratory Library

Non-EPA Data Bases (see Section 3.2):

Bibliographic Retrieval System Data Bases

Address:
6201 Congdon Boulevard
Duluth, MN 55804
(FTS) 8-783-9538

Gulf Breeze Environmental Research Laboratory Library

Non-EPA Data Bases

Dialog Information Services, Inc. Data Bases National
Library of Medicine Data Bases NGWIC

Address: Sabine Island
Gulf Breeze, FL 32561
(FTS) 8-686-9011

Headquarters Law Library

Non-EPA Data Bases (see Section 3.2):

- NEXIS
- NGWIC

Address: 401 M St. SW, Room 2902
Washington, D.C. 20460
(FTS) 8-382-5919

Headquarters Main Library

Non-EPA Data Bases (see Section 3-2):

- CAS ONLINE
- CIS
- DIALOG Information Services, Inc. Data Bases
- HAZARDLINE
- NEXIS/LEXIS
- NGWIC
- News Net, Inc. Data Bases

Address: 401 M St. SW, Room M2904
Washington, D.C. 20460
(FTS) 8-382-5922

Headquarters Office of Pesticides and Toxic Substances Library

EPA Data Bases (see Section 3.1):

- GEMS
- PDMS

Non-EPA Data Bases (see Section 3.2):

- Bibliographic Retrieval System Data Bases
- CAS ONLINE
- CIS
- DIALOG Information Services, Inc. Data Bases
- HAZARDLINE
- NGWIC
- NEXIS

National Library of Medicine Data Bases
NPIRS
OHS-MSDS
Systems Development Corporation Data Bases
Address: Systems Development Corporation Data Bases
401 M St. SW, Room E447
Washington, D.C. 20460
(FTS) 8-382-3568

Narragansett Environmental Research Laboratory Library

Non-EPA Data Bases (see Section 3.2):
NGWIC
Address: South Ferry Road
Narragansett, RI 02882
(FTS) 8-838-5087; Ext. 265 or 268

National Enforcement Investigation Center Library

EPA Data Bases (see Section 3.1):
OHM-TADS
Non-EPA Data Bases (see Section 3.2):
Bibliographic Retrieval System Data Bases
CAS ONLINE
CIS
DIALOG Information Services, Inc. Data Bases
HAZARDLINE
News Net, Inc. Data Bases
NEXIS
NGWIC
National Library of Medicine Data Bases
Address: Building 53, Box 25227
Denver Federal Center
Denver, CO 80225
(FTS) 8-234-5765

Region 1 Library

Non-EPA Data Bases (see Section 3.2):
Bibliographic Retrieval System Data Bases
CAS ONLINE
CIS
DIALOG Information Services, Inc. Data Bases
NGWIC

National Library of Medicine Data Bases

Address: JFK Federal Building, Room 2100-B
Boston, MA 02203
(FTS) 8-223-5791

Region 2 Field Office Library

Non-EPA Data Bases (see Section 3.2):

DIALOG Information Services, Inc. Data Bases
NGWIC

Address: Edison, NJ 08813
(FTS) 8-340-6762

Region 2 Library

Non-EPA Data Bases (see Section 3.2):

DIALOG Information Services, Inc. Data Bases
NGWIC

Address: 26 Federal Plaza
New York, NY 10278
(FTS) 8-264-2881

Region 3 Library

Non-EPA Data Bases (see Section 3.2):

CIS
DIALOG Information Services, Inc. Data Bases
HAZARDLINE
National Library of Medicine Data Bases
NGWIC
OHS-MSDS

Address: Curtis Building, 3PM24
6th and Walnut Streets
Philadelphia, PA 19106
(FTS) 8-597-0580

Region 4 Library

EPA Data Bases (see Section 3.1):

GEMS
PDMS

Non-EPA Data Bases (see Section 3.2):

CAS ONLINE
CIS
DIALOG Information Services, Inc. Data Bases
HAZARDLINE

NGWIC
NEXIS
National Library of Medicine Data Bases
NPIRS
OHS-MSDS
Systems Development Corporation Data Bases

Address: 345 Courtland Street NE
Atlanta, GA 30365
(FTS) 8-257-4216

Region 5 Library

Non-EPA Data Bases (see Section 3.2):

Bibliographic Retrieval System Data Bases
CIS
DIALOG Information Services, Inc. Data Bases
NEXIS
NGWIC
Systems Development Corporation Data Bases

Address: 230 South Dearborn St, Room 1420
Chicago, IL 60604
(FTS) 8-353-2022

Region 6 Library

Non-EPA Data Bases (see Section 3.2):

NGWIC

Address: 1201 Elm Street
First International Building
Dallas, TX 75270
(FTS) 8-729-7341

Region 7 Library

Non-EPA Data (see Section 3.2):

NEXIS
NGWIC

Address: 324 East 11th Street
Kansas City, MO 64106
(FTS) 8-758-3497

Region 8 Library

Non-EPA Data Bases (see Section 3.2):

DIALOG Information Services, Inc. Data Bases
NGWIC

Address:
1860 Lincoln Street
Denver, CO 80295
(FTS) 8-327-2560

Region 9 Library

Non-EPA Data Bases (see Section 3.2):

CIS
DIALOG Information Services, Inc. Data Bases
NGWIC
OHS-MSDS

Address:
215 Fremont Street
San Francisco, CA 94105
(FTS) 8-454-8255

Region 10 Library

Non-EPA Data Bases (see Section 3.2):

CIS
DIALOG Information Services, Inc. Data Bases
NGWIC
NEXIS
NLM

Address:
Region 10 Information Center, M/S 541
1200 Sixth Ave.
Seattle, WA 98101
(FTS) 8-399-1289

Research Triangle Park Library

EPA Data Bases (see Section 3.1):

OHM-TADS

Non-EPA Data Bases (see Section 3.2):

Bibliographic Retrieval System Data Bases
CAS ONLINE
CIS
DIALOG Information Services, Inc. Data Bases
HAZARDLINE
NGWIC
National Library of Medicine Data Bases

Address: Library Services, MD-35
Research Triangle Park, NC 27711
(FTS) 8-629-2777

Note:

There are two other libraries at the Research Triangle Park facility: The Office of Air Quality Planning and Standards Library and the Meteorology Division Library. Neither of these two libraries have online access to data bases.

Robert S. Kerr Environmental Research Laboratory Library

Non-EPA Data Bases (see Section 3.2):

CIS
NGWIC

Address: P.O. Box 1198
Ada, OK 74820
(FTS) 8-743-2241

CHAPTER 4

DATA FILES AND TAPES

This chapter contains brief descriptions of the data files and tapes cited in Chapter 2. For the purposes of this **Directory** a collection of information is designated a data file rather than a data base if: (1) the data is stored in a manual file and not retrievable through a computerized system; (2) the information it contains is the result of a distinct, one-time data collection effort (e.g., environmental radiation data collected following the accident at the Three Mile Island Nuclear Reactor); or (3) the data contained are no longer being actively updated. A data tape is considered a set of data stored on magnetic tape which is not accessible through any online service.

The chapter is organized with **EPA** data files and tapes presented in Section 4.1, and data files and tapes available through other organizations presented in Section 4.2. The citation for each data file and tape includes a brief description of the file/tape content, format, and availability. A point of contact for additional information (**EPA** Office, other government agency, responsible person's name, or commercial information service) is also provided for each data file and tape. Section 4.3 provides the addresses of all contacts mentioned in the included descriptions.

4.1 EPA DATA FILES AND TAPES

CANAL

see LOVE CANAL AND DATA HANDLING SYSTEM

CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA

Subject: Body-Burden Data
Type: Non-bibliographic
Content:

This comprehensive data source includes information on chemicals that have been identified in human tissues and bodily fluids and wild animal populations. This continuing acquisition is intended to facilitate a more relevant assessment of human exposure to xenobiotics by providing a centralized source of body burden data. The data base is published on an annual basis in tabular format with indices and chemical listings that allow for specific searching. The 1984 version contains 1,900 citations covering 1,600 chemicals in human populations and 5,800 chemicals in animals.

Contact: Cindy Stroup,
FTS 8-382-3891
Exposure Evaluation Division

COMMUNITY HEALTH AIR MONITORING PROGRAM (CHAMP)

Subject: Ambient Air Monitoring Data
Type: Non-bibliographic
Content:

CHAMP contains ambient air monitoring results, in terms of five minute values and hourly averages with peak five minute values, for 16 parameters. The data were collected to support epidemiological studies in approximately 21 cities.

Contact: Jose Sune,
FTS 8-629-3127
Office of Monitoring Systems and Quality Assurance

ECOLOGICAL EFFECTS DATA

Subject: Experimental data on compounds
Type: Non-bibliographic
Content:

This data file contains experimental results obtained by the Fish and Wildlife Service Lab in Denver, Colorado under the Sponsorship of OTS. Included are approximately 5,000 experimental results on 1,850 compounds.

Contact: Charles Aver
FTS 8-382-3464
Health and Environmental Review Division

ECOTOXICOLOGICAL DATA ON ETHOXYLATED SURFACTANTS (ETHOX)

Subject: Acute and Chronic Toxicity
Type: Non-bibliographic
Content:

This manual data base contains acute and chronic toxicity data for ethoxylated surfactants. The data are sorted according to chemical structure features of the various chemicals including number of carbons, number of Ethoxylate units, and terminal functional group. Most of the data are on acute toxicity for aquatic species, although there are some data on chronic toxicity for terrestrial species (e.g., crabs). Approximately 400 records are included in the data base, most of which are unpublished data supplied by the Shell Oil Company.

Contact: Richard G. Clements
FTS 8-382-4270
Office of Toxic Substances

EPA BIBLIOGRAPHIC DATA FILE

Content:

The data file contains citations, with abstracts, for all U.S. Environmental Protection Agency and its predecessor agencies report entered into the NTIS collection.

Availability: NTIS, CP T02, mag tape. Source tape is in COSATI character set.
Character set restricts preparation to 9 track one half inch tape only.
Contact: NTIS

EPIDEMIOLOGICAL STUDIES (EPID)

Subject: Exposure Assessment
Type: Non-bibliographic
Content:

The EPID system contains data extracted from questionnaire responses from population surveys of health status. These data are concerned with acute respiratory disease incidence, asthma attack frequency, and physiologic monitoring results. General environmental data are also contained in the system including demographic information, socio-economic characteristics, and ambient air quality data.

Contact: William Nelson,
FTS 8-629-2330
Office of Health Research

FILES OF EXPOSURE ASSESSMENTS FOR EXISTING CHEMICALS

Subject: Exposure Assessment
Type: Non-bibliographic
Content:

This source of information is a hardcopy file of all exposure assessments done by the Office of Toxic Substances, Chemical Engineering Branch, of Chemicals being considered for regulatory action under TSCA sections 4 and 6. The file consists of internal reports and contractor studies. Reports generally cover workplace exposure and/or estimates of releases to the environment from industrial/commercial facilities. The file covers about 40 chemicals/classes.

Contact:
R. Craig Matthiessen,
FTS 8-382-3694
Office of Toxic Substances

GASTRO-INTESTINAL EFFECTS LITERATURE

Subject: Gastro-Intestinal Effects
Type: Bibliographic
Content:

OTS's Health and Environmental Review Division (HERD) has developed a compilation of reports of gastro-intestinal effects of chemicals extracted from the open literature. This data file consists of 6,000 records covering approximately 2,000 chemicals.

Holder: Office of Toxic Substances, HERD
Responsible Person: David Gould
FTS Phone: 8-382-3399

ITS CHEMICAL SCORES

Subject: Biological Effects of Chemicals
Type: Non-bibliographic
Content:

An Interagency Testing Committee (ITC) has used a scoring system since 1977 to aid in the selection of chemicals to be recommended for testing. The scoring system is used to rank chemicals on the basis of their exposure and biological effects potential. Such a system ranks the chemicals and allows those of highest priority to be selected for detailed review and consideration by the Committee. To date there have been three rounds of scoring covering thousands of chemicals.

Contact:
Robert Brink
FTS 8-382-3820
Office of Toxic Substances

LOVE CANAL AND DATA HANDLING SYSTEM (CANAL)

Subject: Environmental Monitoring Data
Type: Non-bibliographic
Content:

This data base contains all of the data collected in the course of intensive monitoring done in the fall of 1980 in the Love Canal, New York area.

Contact:
Steve Bromberg,
FTS 8-629-2919
Office of Monitoring Systems and Quality Assurance

NATIONAL HUMAN MILK MONITORING PROGRAM (NHMP)

Subject: Milk Sampling Data
Type: Non-bibliographic
Content:

This data base contains concentrations of chlorinated hydrocarbon insecticides and PCB residues found in human milk samples provided by about 3,000 volunteers randomly selected from the entire continental U.S.

Contact: Jerome Blondell,
FTS 8-557-0320
Office of Pesticide Programs

OIL AND HAZARDOUS MATERIALS SPILL INFORMATION RETRIEVAL SYSTEM (OHM-SIRS)

Content:

Included are 10,600 records of data on such items as: names of materials spilled; location and date of spill occurrence; quantity spilled and quantity entering water; source of spill; cause of spill; damages caused by spill; actions taken and by whom; and, comments for the period July 1, 1972 to December 31, 1974.

Availability: NTIS, CP TOI, 1 reel mag tape.
Available only in 9 track, 1600 bpi, odd parity, EBCDIC.
Contact: NTIS

POTENTIAL SUBSTANTIAL RISKS

Subject: Chemical Health Risks
Type: Manual File of Chemical Information
Content:

This source contains notifications required of manufacturers who receive or possess information which reasonably supports a conclusion that a chemical presents a substantial risk. As of January 1986, OTS had received 580 notifications. In addition, OTS has received 470 other notifications, on a For Your Information (FYI) basis, that did not specifically cite Section 8(e). Currently, about 40-50 section 8(e) notifications are received a year.

Contact: David Williams,
FTS 8-382-3468
Existing Chemicals Assessment Division

RESOURCE CONSERVATION RECOVERY ACT NOTIFICATION DATA FILE

Content:

This file contains data compiled for the Resource Conservation Recovery Act. EPA Form 8700-12, Notification of Hazardous Waste Activity, was used to collect the data. The file was updated with information compiled from Applications for Hazardous Waste Permits, EPA Form 3510-3. The data includes names and addresses of facility owners and operators, as well as facility contacts names and phone numbers. The data indicates whether a facility is a generator, treatment, storage or disposal facility, and/or transporter of hazardous waste. Code numbers of waste handled, taken from 40 CFR Part 261, are also listed.

Availability: NTIS, CP T02, mag tape. Source tape is in the EBCDIC character set.
Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape.
Contact: NTIS

STORAGE AND RETRIEVAL OF AEROMETRIC DATA (SAROAD), National Air Data Branch

Content:

SAROAD is a storage and retrieval system for air quality data. Data are reported to **EPA** by the states from about 4,000 reporting facilities nationally. Criteria pollutants are well covered, though not all pollutants are monitored at all sites.

Contact:
Jake Summers,
National Air Data Branch,
U.S. **EPA**

SURVEY METER AND HISTORICAL DOSIMETRY DATA BASE (SM/HD)

Subject: Gamma Radiation Measurements
Type: Non-bibliographic
Content:

This data base contains gamma radiation measurements taken in the 1950's and 1960's as part of a surveillance of the Nevada Nuclear Weapons Test Site. Geographic areas included in the surveillance include Nevada, Utah, Arizona, Idaho, and California.

Contact:
Gilbert Potter,
FTS 8-545-2321
Office of Monitoring Systems and Quality Assurance

THREE MILE ISLAND ENVIRONMENTAL RADIATION (TMI RAD)

Subject: Environmental Radiation Measurements
Type: Non-bibliographic
Content:

This data file contains environmental radiation data collected following the March 28, 1979 accident at the Three Mile Island Nuclear Reactor in Pennsylvania. Data from **EPA**, the Public Health Service, the Nuclear Regulatory Commission, the Department of Energy, the State, and the utility itself are included.

Contact:
William Kirk,
FTS 8-590-4866
Office of Radiation Programs

TSCA (TOXIC SUBSTANCES CONTROL ACT) CHEMICAL SUBSTANCES INVENTORY:INITIAL INVENTORY AND CUMULATIVE SUPPLEMENT TWO, PLANT SITE INFORMATION FILE

Content:

The TSCA Chemical Substances Inventory: Initial Inventory and Cumulative Supplement Two, Plant Site Information File lists names and addresses for more than 6000 processors and manufactures of chemicals. This file, with the Production Information File along with the TSCA Preferred Name file and Synonym file, provides the complete Toxic Substances Control Act.

Availability: NTIS, CP T02, mag tape. Source tape is in EBCDIC character set. Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape.
Contact: NTIS

TSCA (TOXIC SUBSTANCES CONTROL ACT) CHEMICAL SUBSTANCES INVENTORY: INITIAL INVENTORY AND CUMULATIVE SUPPLEMENT TWO, PRODUCTION INFORMATION FILE

Content:

The TSCA Chemical Substances Inventory: Initial Inventory and Cumulative Supplement Two, Production Information File contains production information for more than 50,000 chemicals. This file includes Manufacturing Identification Numbers (MID) but not manufacturer names and locations. The TSCA Chemical Substances Inventory Initial Inventory Cumulative Supplement Two, Plant Site Information File tape must be used to find this information. The MID links the production figure to the plant sites. See also TSCA Chemical Substances Inventory and Cumulative Supplement Two, Preferred Name File and Synonym File to obtain the complete inventory.

Availability: NTIS, CP T02, mag tape. Source tape is in EBCDIC character set.
Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape.

Contact: NTIS

TSCA (TOXIC SUBSTANCES CONTROL ACT) CHEMICAL SUBSTANCES INVENTORY:INITIAL INVENTORY AND CUMULATIVE SUPPLEMENT TWO, PREFERRED NAME FILE AND SYNONYM FILE

Content:

The Toxic Substances Control Act Chemical Substances Inventory: Initial Inventory and Cumulative Supplement Two, Preferred Name File and Synonym File lists names for more than 50,000 chemicals substances. File I includes:TSCA CAS Registry Numbers (a listing of chemical names by CAS Registry No.), and File 2 includes:TSCA Synonyms (an alphabetical listing of synonyms). See also the TSCA Chemical Substances Inventory. Initial Inventory and Cumulative Supplement Two, Plant site Information File and Production Information file to obtain the complete inventory.

Availability: NTIS, CP T02, mag tape. Source tape is in EBCDIC character set.
Tapes can be prepared in most standard 7 or 9 track recording modes for one-half inch tape.

Contact: NTIS

TSCA (TOXIC SUBSTANCES CONTROL ACT) NEW CHEMICALS

Content:

This source contains information collected on chemicals proposed for manufacture which are not included on the July 1979 inventory of existing chemicals. Producers of such new chemicals are required to notify OTS at least 90 days prior to manufacture, providing information about the chemical, its intended production and use, and any available health and safety information (Section 5 of TSCA). Those manufacturers seeking an exemption from premanufacture review for test marketing purposes can apply for such exemption 45 days in advance of test marketing. Exemptions from the full 90 day review have recently been established for certain polymers and low volume chemicals. As of March 28, 1986, OTS had received 6,721 Premanufacturing Notification (PMN) submissions, 379 test marketing exemption (TME) requests, and 243 low volume and polymer exemption applications. Currently about 1,600 PMN, 60 TME, and 475 low volume and polymer exemption requests are received each year.

Contact:
Wendy Cleland-Hamnett,
FTS 8-382-3725
Chemical Control Division

TSCA SECTION 4 CHEMICAL BIBLIOGRAPHIES

Subject: Chemical Data
Type: Bibliographic
Content:

The Test Rules and Development Branch within OTS maintains complete bibliographies on all TSCA Section 4 chemicals. Section 4 authorizes **EPA** to require the development of any needed new test data on chemicals that may pose an unreasonable risk or ones that have high exposure or high release. To date, OTS has received 620 studies on 58 different Section 4 chemicals, and many more tests are underway.

Contact:
Harriet Corbet
FTS 8-382-8140
Office of Toxic Substances

WATER SOLUBILITY DATA

Type: Non-bibliographic
Content:

This collection of more than 3,000 records includes published values on water solubility data, intended to provide rapid access to such information for assessment purposes.

Contact:
Robert Lipnick,
FTS 8-382-4274
Health and Environmental Review Division

4.2 NON-EPA DATA FILES AND TAPES

ANNUAL OBSERVATION WELL FILE (AOWF)

Content:

Historical file of groundwater level measurements and producing formations for all declared groundwater basins in New Mexico.

Contact:
James Hudson,
U.S. Geological Survey,
(505) 766-2011

AUTOMATIC DIGITAL RECORDER TAPES (ADR)

Content:

Water data such as river stages, temperature, groundwater levels, specific conductivity, and dissolved oxygen are punched on paper tape in the file in raw form.

Contact:
Charles R. Showen,
U.S. Geological Survey,
(703) 860 6871

BASIC WELL DATA FOR PROFESSIONAL PAPER 796

Content:

The coverage is of spatial distribution of permeability for the Atlantic Coastal Plain from North Carolina to New York.

Contact:

Donald J. Dolnack,
U.S. Geological Survey,
(703) 860 6031

GEOECOLOGY DATA BASE (SAS Format)

Content:

The Geoecology Data Base represents a unique compilation of computerized environmental data for research and development. The system is designed to provide rapid access to data at appropriate spatial and temporal scales for environmental impact assessment and planning. Data are stored at the county level of resolution for the conterminous United States. The Geoecology Data Base contains selected data on terrain and soils, water resources, forestry,vegetation, agriculture, land use, wildlife, air quality, climate, natural areas, and endangered species. Basic files on humanpopulation are also included to complement the environmental files.

Availability: NTIS, CP T02, mag tape. Source tape is an IBM/SAS formatted file.
Contact: NTIS

INDEX TO GEOLOGIC MAPS

Content:

The index has been developed as a data base and data base management system that provides three main capabilities. Geo index consists of fixed-length records that supply the following information on published maps:unique numeric identifier, state, author, year, title, county or counties, publisher, series, emphasis, area covered by the map, coverage in latitude and longitude, center point in latitude and longitude, depositories, type of base map, and plate number.

Contact:

Yula Sakss,
U.S. Geological Survey,
(703) 860-7297

NATIONAL STREAM QUALITY ACCOUNTING NETWORK (NASQAN), GEOLOGICAL SURVEY

Content:

The data base is a subset of the U.S. Geological Survey's WATSTORE. A uniform water quality parameter list information on instantaneous discharge, specific conductance, temperature, pH, dissolved oxygen, fecal streptococcal and fecal coliform bacteria, suspended sediment, etc.

Contact:

James Schornick, Dick Smith,
Water Resource Division, USGS

MIXING HEIGHT STUDIES

Content:

The data utilized in generating this file are hourly surface weather observations and upper air observations. The major parameters that make up this file are date, morning type indicator, morning mixing depth, morning average wind speed through mixing depth, morning average surface wind speed, afternoon type indicatory, afternoon mixing depth, afternoon average wind speed through mixing depth, and afternoon average surface wind speed. Data is from 1960 to 1964 and various later periods of record.

Contact: National Climatic Data Center

STABILITY ARRAY (STAR)

Content:

The STAR output consists of frequency and percent frequency tables of wind direction versus wind speed for each stability category. These star data may be summarized on a monthly, seasonal, or annual basis. The major parameters that make up this file are wind direction, stability class, wind speed frequencies, station ID, and beginning and ending year.

Contact: National Climatic Data Center

SUMMARY OF THE MONTH CO-OP ELEMENT FILE

Content:

This file contains monthly averages or totals of daily data that are measured primarily by cooperative stations. The major parameters that make up this file are monthly: maximum and minimum temperatures; mean temperature with departure from normal; total snowfall and maximum snow depth; total precipitation with departure from normal; extreme high and low temperatures; freeze data; evaporation; and total heating and cooling degree days. Data is from 1876 to present, and is updated monthly.

Contact: National Climatic Data Center

SURFACE AIRWAYS OBSERVATIONS

Content:

The major parameters that make up this file are time; ceiling height; horizontal visibility; weather; wind - direction and speed; dry-bulb, wet-bulb, and dew point temperatures; relative humidity; sea level pressure and station pressure; and total sky cover and total opaque sky cover. Data is from 1948 through present, and is updated monthly.

Contact: National Climatic Data Center

U.S. SOIL TEMPERATURES

Content:

The primary source of information for this file is daily measurements taken by Federal government, state government and university sponsored Agriculture Research and Experiment station who are part of the cooperative station network. The major parameters that make up this file are depth of soil temperature measurement, and daily temperatures. Data is from 1967 to the present, and is updated annually.

Contact: National Climatic Data Center

VOLATILE ORGANIC CHEMICALS IN THE ATMOSPHERE: AN ASSESSMENT OF AVAILABLE DATA

Content:

A significant body of information is currently available to characterize the burden of possibly-hazardous organic chemicals (HOCs) in ambient environments. However, these data have not been accessible in an organized format, and no attempt had been made to study their significance or to integrate them into a useful andcohesive document. In this study, ambient data, primarily from the years 1970 through 1980, from 241 references covering 151 chemicals were collected and collated into a computer-accessible data base. Data acquisition has been limited primarily to a few geographical regions, and most sampling programs have been performed in the warmer months and during daylight hours. Specific recommendations are made for future studies regarding data reporting. A strategy for an effective national monitoring program was presented.

Availability:	NTIS, CP T02, mag tape. Source tape is in ASCII characterset. Character set restricts preparation to 9 track, one-half inch only.
Contact:	NTIS

4.3 ADDRESSES FOR DATA FILES AND TAPE CONTACTS

National Air Data Branch
U.S. Environmental Protection Agency, MD-14
Research Triangle Park, NC 27711
Telephone: (919) 541-5582

National Climatic Data Center
User Services Branch
Federal Building
Asheville, NC 28801
Telephone: (704) 259-0682

National Technical Information Service (NTIS)
U.S. Department of Commerce
Springfield, VA 22161
Telephone: (703) 487-4650
Telex: 89-9405

U.S. Environmental Protection Agency,
Headquarters Including:
    Office of Health Research
    Office of Monitoring Systems and Quality Assurance
    Office of Pesticide Programs
    Office of Radiation Programs
    Office of Toxic Substances
401 M Street, S.W.
Washington, D.C. 20460
Telephone: (202) 755-9112

U.S. Geological Survey
Water Resources Scientific Information Center
425 National Center
Reston, VA 22902
Telephone: (703) 648-6818

CHAPTER 5

MODELS

This chapter lists numerous exposure assessments (environmental fate and transport) and dose response models which may be useful in performing *risk assessments*. The section is organized with **EPA** models presented in Section 5.1 and "**non-EPA**" models presented in Section 5.2. Within each section, the models are further grouped into particular types (e.g., atmospheric, surface water, ground water, fate, and dose-response models) with all models of a given type listed alphabetically. References for additional information for each model are given by either providing an office and an individual's name to contact, or by citing a literature reference. These literature citations are fully referenced in Section 5.3.

The list of models presented in this section is far from an exhaustive compilation of all exposure assessment models; nor does the list below represent all the different types of models which may be useful in *risk assessment* (e.g., pharmacokinetic models). Instead, this section describes accepted, commonly used, environmental fate, transport and dose-response models that were either: (1) identified through interviews with **EPA** and **non-EPA** employees; (2) taken from the list off **EPA's** "*risk assessment*" models compiled in the Information System Inventory[8]; or (3) selected from **EPA** or **non-EPA** publications and references using professional judgment on the applicability of a model in the *risk assessment* process. There are countless other models besides those listed below which may also be acceptable and may in fact be more applicable or useful for a given situation.

5.1 EPA MODELS

5.1.1 Atmospheric Fate Models

BOXMDD80

- Contains population retrieval program
- Applicable primarily to regions containing many diffuse emission sources
- Steady-state, Gaussian distribution
- Exposure routine is included
- Available on GEMS

Reference:	Hanna, 1972
Contact for access:	Loren Hall, **EPA** (202) 382-3931

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[8] The Information Systems Inventory is an **EPA**-wide compilation of data bases, models, and other information systems which can be segregated into groups having the same purpose (e.g., information systems for the purpose of *risk assessment*). More information on this inventory is available through **EPA's** Office of Information Resources Management, Information Management Branch.

CLIMATOLOGICAL DISPERSION MODEL (CDM)

- Long-term seasonal or annual
- Point or area sources
- Gaussian plume model
- Simulates non-conservative pollutants
- Can simulate turbulence over urban areas
- Outputs long-term average concentrations at user specified receptors
- Requires stability array data
- FORTRAN V program language; has been implemented on the UNIVAC 1110
- 22K bytes storage required
- Software available as part of UNAMAP package for $420
- A modified version (CDMQC) includes calibration of individual point and area source contribution lists and of averaging time transformations.

Documentation:	Busse and Zimmerman, 1976
Software:	Computer Products, NTIS, Springfield, VA 22161

CRSTER

- Modified steady state Gaussian Plume algorithm.
- Estimates ground level concentrations resulting from up to 19 colocated elevated stack emissions.
- Terrain adjustment can be made.
- Prints out the highest and second highest 1-hour, 3 hour and 24 hour concentrations; also gives annual mean concentrations at 180 receptors.

Documentation:	U.S. EPA, 1977.

INDUSTRIAL SOURCE COMPLEX

- Long-term or short-term, point, area, or line sources, single or multiple sources
- Models gravitational settling of particulates, providing deposition
- Release rates can be varied as a function of time
- Not applicable to complex terrain
- May provide overly conservative short-term maximum values for calm wind conditions
- Requires stability array data
- Extensive input data required to make use of sophisticated features
- FORTRAN IV program language, implemented on UNIVAC 140
- Approximately 65 K bytes storage required
- Available through GEMS

Documentation:	Bowers et. al. 1979
Software:	Computer Products, NTIS, Springfield, VA 22161

POINT SOURCE DISCHARGE -- CONCENTRATION AT A DISTANCE (PTDIS)

- Steady-state Gaussian plume model
- Point source
- Accommodates limit to upward vertical mixing
- Short-term
- Assumes conservative pollutant
- Produces estimates of hourly concentrations at a user selected downwind distance
- Available through GEMS
- FORTRAN IV Program, applicable to wide range of computers; has been implemented on UNIVAC 1110
- Approximately 12K bytes memory required
- Software available as part of UNAMAP package, for $420

References:	Turner and Busse 1973, General Software Corporation 1982
Software:	Computer Products NTIS, Springfield, VA 22161

POINT SOURCE DISCHARGE -- MAXIMUM CONCENTRATION (PTMAX)

- Steady-state Gaussian plume model
- Point-source
- Short-term
- Assumes conservative pollutant
- Produces maximum hourly concentrations for each stability and wind speed, location of maximum concentration
- Available through GEMS
- Approximately 12 K bytes memory required
- Software available as part of UNIMAP package, for $420
- FORTRAN IV Program, applicable to wide range of computers; has been implemented on UNIVAC 1110

References:	Turner and Busse, 1973, General Software Corporation, 1982
Software:	Computer Products, NTIS, Springfield, VA 22161

PTMTP

- Estimates the concentration from a number of point sources to a number of arbitrarily located receptors at/or above ground level.
- Hourly meteorological data is used.
- Hourly concentrations and averages over any averaging time from 1 to 24 hours can be obtained.
- Downwind and crosswind distances are determined for each source receptor pair.

Documentation:	Turner and Busse, 1973.

POINT, AREA, LINE SOURCE ALGORITHM (PAL)

- A short-term Gaussian steady-state algorithm.
- Estimates concentrations of stable pollutants for point, line and area sources.
- Valuable emission rate along line source can be included.
- Intended for smaller scale analysis such as for shipping centers, airports and single plants.
- Hourly concentrations are estimated.

Documentation: Peterson, 1978.

RAM

- A Gaussian plume short term multiple source air quality algorithm.
- Estimate concentrations of stable pollutants from urban point and area sources.
- Hourly meteorological data are used.
- Allows determination of downwind receptor locations to ensure good area coverage with minimum number of receptors.

Documentation: Turner and Novak, 1978.

TEXAS EPISODIC MODEL (TEM)

- Steady state model
- Point or area sources
- Short-term - 10 minutes to 24 hours
- Produces maximum and average concentrations over time periods selected by user
- User can select up to 2500 down-wind receptor points, according to an automatic or specific grid array
- Handles nonconservative pollutants
- Up to 24 meteorologic scenarios can be input for a single run
- FORTRAN program applicable to a wide range of computer types; has been implemented on Burroughs 6810/11
- Requires approximately 26 K bytes memory
- Engineering, meteorology, atmospheric transport background useful

References: Christiansen, 1976

VALLEY

- Short- or long-term
- Simulates plume impaction in complex terrain
- Provides screening estimates of worst-case short-term concentrations
- Provides annual average concentrations
- 112-receptor grid
- Accommodates nonconservative pollutants
- Requires stability array data for long-term option
- Requires user-input worst-case meteorological data for short-term screening option
- May require careful analysis of output by experienced air quality modeler
- FORTRAN V program, applicable to wide range of computers
- Approximately 13 K bytes memory required

- Software available as part of UNAMAP series, for $420

Documentation: Burt, 1977.
Software: Computer Products,
NTIS,
Springfield, VA 22161

5.1.2 Surface Water Fate Models

CHANNEL TRANSPORT MODEL (CHNTRN)

- Time-varying, 1-dimensional model
- Models organic pollutants
- Second-order decay mechanisms
- Models rivers, lakes, estuaries, and coastal waters
- Can be coupled with a hydrodynamic model, CHNHYD, for estimation of flow dynamics where such data is not available
- Requires extensive data input, and extensive setup time
- Has not been field tested and documentation is currently under review
- FORTRAN IV program language
- Applicable to IBM 3933 computer, and others

References: Yeh 1982
Documentation: Dr. G.T. Yeh
Environmental Sciences Division
Oak Ridge National Laboratory
P.O. Box X
Oak Ridge, Tennessee 37830
(615) 574-7285

CHEMICAL AND STREAM QUALITY MODEL (TOXIWASP)

- Time-varying, 3-dimensional model
- Comprehensive second-order decay kinetics for organic pollutants
- Models rivers and estuaries and it can be applied to lakes
- Very data intensive model
- Applicable to IBM 370 or PDP 11/70
- Software in FORTRAN IV; requires 64 K byte memory
- Requires 150-300 man hours for setup

Documentation and
Software: Robert Ambrose
Center for Water Quality Modeling
U.S. EPA
Athens, GA 30612
(404) 546-3546

CHEMICAL TRANSPORT AND ANALYSIS PROGRAM (CTAP)

- Steady state, 3-dimensional compartmental model
- Complex computer program
- Contains comprehensive second order decay kinetics for organics (most models only have first-order kinetics)
- Models organic chemicals
- Suitable for freshwater, non-tidal aquatic systems
- Requires extensive data input
- Has been incorporated into EPA OTS GEMS system
- An estimated 350 man hours required for installation and setup, assuming all data is readily available
- Well documented and recommended for use over most other models
- Available on magnetic tape for installation on mainframe or small computers (e.g., PDP-11 or HP 3000); batch version requires 64 K bytes memory at a minimum, more for complex modeling
- Also available in interactive version, requiring 164 K bytes memory plus 2 K for each chemical and 2.5 K bytes for each environment

References: Burns et al. 1982
Documentation: ORD Publications,
Center for Environmental Research Information
U.S. EPA
Cincinnati, OH 45268
513-684-7562; or

Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

DYNHYD3

- A simple 2-dimensional hydrodynamic model capable of handling variable tidal cycles, wind, and un steady inflows.
- Updated from the Potomac Dynamic Estuary Model (DEM).
- Has the ability to produce an output file that can be linked with WASP3 (described near the end of this section) to supply the flows and volumes to the water quality model.
- Designed for the DOS environment on the IBM PC XT/AT family of microcomputers and compatible systems.
- Language: FORTRAN 77
- Approximate run time using sample data sets: 16 minutes.

Contact: Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

ENHANCED STREAM WATER QUALITY MODEL (QUAL2E)

- A steady state model for conventional pollutants in branching streams and well mixed lakes.
- Includes conservative substances, temperature, coliform bacteria, biochemical oxygen demand, dissolved oxygen, nitrogen, phosphorus, and algae.
- Widely used for waste load allocation and permitting, in the United States and other countries.
- Designed for the DOS environment on the IBM PC XT/AT family of microcomputers and compatible systems.
- Approximate run time observed using sample data sets: 1 minute.

Contact:
Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

EXPOSURE ANALYSIS MODELING SYSTEM (EXAMS)

- Subject: Synthetic Organic Chemicals in Aquatic Systems
- Simulation model
- 1, 2, or 3 dimensional
- Runs analyses of initial conditions, time variations, steady state analysis
- Uses a set of fundamental process models that accept standard chemical parameters and limnological data as input parameters
- DEC-VAX family of computers and IBM PC compatibles
- FORTRAN 77 standard
- Available through GEMS

Contact:
Dr. Lawrence Burns
Office of Environmental Processes and Effects Research
Environmental Research Laboratory
Athens, GA
(404) 546-3511

HYDROLOGICAL SIMULATION PROGRAM - FORTRAN (HSPF)

- Time-varying, 1-dimensional model
- Requires extensive data input
- Designed for year-round simulation
- Most suitable to minicomputers(e.g., HP 3000, PRIME, HARRIS) as model utilizes direct access input-output, which can be costly on mainframe computers
- Models organic pollutants
- Second-order decay mechanisms
- Models non-tidal rivers and streams and mixed lakes
- Has been used on IBM 370 series computers
- Requires 250 K bytes of overlay computers type storage

References: Johanson et. al. 1980
Software: Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

METALS EXPOSURE ANALYSIS MODELING SYSTEM (MEXAMS)

- Steady state, 3-dimensional compartmental model
- Complex computer program
- A combination of two models (MINTEQ and EXAMS) designed for modeling of metal loadings
- Suitable for freshwater, non-tidal aquatic systems
- Complex metal dynamics requiring extensive data input
- Can be used with mainframe or small (e.g., PCP 11/70 or HP 3000 computers)
- Interactive format
- Contains data base with thermodynamic properties of 7 metals

Further information: Yasuo Onishi
Battelle, Pacific Northwest Laboratories
Richland, WA 99352
(509) 376-8302

Documentation: Center for Water Quality Modeling, EPA
Environmental Research Laboratories
Athens, GA
(404) 546-3585

MICHIGAN RIVER MODEL (MICHRIV)

- Steady-state, 1-dimensional model
- Easy to set up and use
- Computer program written in FORTRAN
- Requires minimal computer programming
- Similar to SLSA but can model more than one reach
- Intended for metals
- Models rivers and streams

References: Delos et al. 1984
Technical Assistance
Available from: Bill Richardson
U.S. EPA
Environmental Research Laboratory-Duluth
Large Lakes Research Station

MINTEQ (see Section 5.1.3)

PROBABILISTIC DILUTION MODEL (PDM)

- Estimates the percent of time a given concentration level may be exceeded in recieving streams

- Model estimates based on statistical distribution of daily volume flow and on solution of mass balance dilution evaluation
- Contains averages of mean and low flows of streams in major river basins of U.S., broken down by direct and indirect discharges and standard industry classification codes
- Designed for use on personal computers

Holding Office: Office of Toxic Substances
Responsible Person: Karen Hammerstrom
FTS Phone: 8-382-3896

SEDIMENT-CONTAMINANT TRANSPORT (SERATRA)

- Time-varying, 2-dimensional model (longitudinal and vertical)
- Complex sediment transport mechanisms
- Second-order decay mechanisms for organic pollutants
- Models rivers and lakes
- Requires extensive data input
- Computer program written in FORTRAN preprocessor language FLECS, batch mode
- Has been field tested and is available for use
- Second-order decay mechanisms for organic pollutants.
- Requires an estimated 750 man hours for setup, assuming all required data are readily available

References: Onishi and Wise 1982a
Onishi and Wise 1982b
Documentation: ORD Publications
Center for Environmental Research Information
U.S. EPA
Cincinnati, OH 45268
(413) 684-7562
Technical Assistance: Robert Ambrose
U.S. **EPA**,
Athens Env. Research Lab
Center for Water Quality Modeling
Athens, GA 30613
(404) 546-3546

TIME-DEPENDENT, THREE-DIMENSIONAL TRANSPORT MODEL

- Calculates hydrodynamic transport of conservation and non conservation substances in surface water bodies
- User-specified options permit application to conservative substances (e.g., chloride) and non-conservative substances (e.g., suspended solids)
- Estimates time-dependent concentrations

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: J. F. Paul
FTS Phone: 8-838-5087

TIME-DEPENDENT, THREE-DIMENSIONAL, VARIABLE DENSITY HYDRODYNAMIC MODEL

- Estimates the movement of pollutants in thermal discharges in harbors, bays, lake basins, entire lakes, estuaries, marine coastal areas, etc.
- Calculates velocities, temperatures and salinity

- Results of model can be used as input to a separate transport model
- Various user-specified versions to consider the receiving waters in different ways (e.g., water surface treated as a rigid lid or a free-surface, or bottom boundary condition specified as no slip or slip)

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: J. F. Paul
FTS Phone: 8-838-5087

TOXIC ORGANIC SUBSTANCE TRANSPORT AND BIOACCUMULATION MODEL (TOXIC)

- Quasi-dynamic, 3-dimensional compartment model
- Program language is FORTRAN
- Complex biological uptake mechanisms
- Models pesticides in reservoirs and aquatic impoundments
- Only time-varying functions for loading, not flows
- Good for biological accumulation but lacking in chemical fate mechanisms
- Applicable to IBM 370 and 750 Prime systems
- FORTRAN program in batch mode
- User support is limited; no user manual is available

References: Schnoor et al. 1981
Software: Jerry Schnoor
Civil and Environmental Engineering
Energy Engineering Division
University of Iowa
Iowa City, IA 52248
(319) 353-7262

TOXIWASP

see CHEMICAL AND STREAM QUALITY

TRANSIENT ONE-DIMENSIONAL DEGRADATION AND MIGRATION MODEL (TODAM)

- Time varying, 1-dimensional model
- Second-order decay mechanism
- Models rivers and estuarine systems
- Exterior hydrodynamic model (e.g., EXPLORE) is required to provide channel and flow characteristics to TODAM
- Requires extensive data input
- Complex FORTRAN program, written in the preprocessor language FLECS or in FORTRAN IV
- Applicable to VAC or PDC 11/70 computers (batch mode)
- TODAM has been applied; however documentation is currently under review; release date unknown

References: Onishi et. al. 1982
Further Information: Yasuo Onishi
Battelle-Pacific Northwest Laboratories and ICF Northwest
Richland, WA 99352
(509) 376-8302

WATER QUALITY ANALYSIS SIMULATION PROGRAM (WASP3)

- A generalized modeling framework for contaminant fate and transport in surface waters.
- Based on a flexible compartment modeling approach, which allows WASP3 to be applied in one, two, or three dimensions.
- Problems that have been studied using WASP3 include biochemical oxygen, demand-dissolved oxygen dynamics, nutrients and eutrophication, bacterial contamination, and toxic chemical movement.
- Can be used with subroutines selected from a library or written by user (e.g., TOXIWASP described earlier in this section).
- Designed for the DOS environment on the IBM PC XT/AT family of micro-computers and compatible systems.
- Language: FORTRAN 77

Contact:
Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

WATER QUALITY ASSESSMENT METHODOLOGY (WQAM)

- Steady-state, 1-dimensional
- Requires only desk top calculations
- Provides canonical information
- Models lakes, rivers, and estuaries
- Easy to set up and use
- No computer programming needed; requires only hand calculator
- Recommended if time, costs, or information are restrictive

References: Mills et al. 1982
Documentation:
ORD Publications
U.S. EPA,
Cincinnati, OH 45268
(513) 684-7562

WATER QUALITY MODELING SYSTEM FOR THE GREAT LAKES (WQMSGL)

- Consists of three subsystems which allow user to develop, calibrate, and verify water quality models for aquatic systems
- Developed to serve EPA's research mandates for the Great Lakes, but applicable to any surface water system
- Can be applied to most water quality problems, constituents, and interactions

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: William Richardson
FTS Phone: 8-226-7811

5.1.3 Unsaturated Zone and Groundwater Fate Models

MINTEQ

- A geochemical model capable of calculating equilibrium aqueous specification, adsorption, gas phase partitioning, solid phase saturation states, and precipitation dissolution of 11 metals (arsenic, cadmium, chromium,copper, lead, mercury, nickel, selenium, silver, thallium, and zinc).
- Can solve a broad range of chemical equilibrium problems for surface and ground waters.
- Contains an extensive thermodynamic data set.
- Designed for the DOS environment on the IBM PC XT/AT family of micro-computers and compatible systems.
- Language: FORTRAN 77.
- Approximate run time using sample data sets: 4 minutes.

Contact:
Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

PESTICIDE ROOT ZONE MODEL (PRZM)

- Simulates the vertical movement of pesticides in unsaturated soil within and below the plant root zone, and extending to the water table.
- Uses generally available input data that are reasonable in spatial and temporal requirements.
- Consists of hydrology and chemical transport components that simulate runoff, erosion, plant uptake, leaching, decay, foliar wash off, and volatilization of a pesticide.
- Designed for the DOS environment on the IBM PC XT/AT family of micro-computers and compatible systems.
- Language: FORTRAN 77.
- Approximate run time using sample data sets: 8 minutes.

Contact:
Center for Water Quality Modeling
Environmental Research Laboratory
U.S. EPA
Athens, GA 30613
(404) 546-3585

PESTICIDES ANALYTICAL TRANSPORT SOLUTION (PESTAN) or ANALYTIC TRANSIENT 1,2,3 DIMENSIONAL MODEL (AT123D)

- Predicts pesticide and organic pollutant movement to ground water
- Environmental and chemical data input interactively
- Available through GEMS
- Version in GEMS features an automated link with Seasonal Soil Model (SESOIL) to allow modeling of chemicals moving from the unsaturated zone into ground water

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: David M. Walters
FTS Phone: 8-743-2261

REGULATOR AND TREATMENT ZONE MODEL (RITZ)

- Models pollutant transport by leaching and volatilization
- Estimates biological degradation of the pollutant
- Considers the effect of an oil phase on pollutant transport

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: Tom Short
FTS Phone: 8-743-2234

SEASONAL SOIL COMPARTMENT MODEL (SESOIL)

- Long-term fate simulations
- Accounts for numerous hydrologic, meteorologic characteristics of site
- Accounts for numerous transfer, transformation processes; absorption volatilization, degradation, biodegradation
- Models organics, inorganics
- Handles up to 3 layers of soil type, permeabilities
- Integrated into GEMS
- Versatile, easy to use
- FORTRAN program language; has been implemented on IBM 370, VAX 11/780
- Produces contaminant concentration distribution in unsaturated zone, quality of ground water runoff

Documentation: Bonazountas and Wagner, 1981
Contact for access: Mr. Loren Hall
U.S. EPA,
Exposure Evaluation Division
Washington, D.C.
(202) 382-3931

SIMULATED WASTE ACCESS TO GROUND WATER (SWAG)

- Predicts organic pollutant transport to groundwater
- Three compartment analytical computer model
- Considers transformations in the soil-geological matrix
- Data is input interactively by the user

Holding Office: Office of Environmental Processes and Effects Research
Responsible Person: David M. Walters
FTS Phone: 8-743-2261

THREE-DIMENSIONAL PLUMES IN UNIFORM GROUND WATER FLOW (PLUMEZD)

- Estimates concentration distribution in a leachate plume emanating from a point source
- Includes both linear absorption and first-order reactions

Holding Office: Office of Emergency Processes and Effects Research
Responsible Person: Carl Enfield
FTS Phone: 8-743-2334

5.1.4 Exposure Assessment Models

ATMOSPHERIC DISPERSION OF RADIONUCLIDES (AIRDOSE-EPA)

- Estimates annual intakes and exposures from the atmospheric release of radionuclides
- The intake estimates provided as inputs to DARTAB to assess individual or collective doses/risks associated with chronic releases
- Atmospheric dispersion, wet and dry deposition, and food pathway models included
- Radionuclide chain ingrowth and decay considered
- Environmental removal taken into account

Office: Office of Radiation Programs
Responsible Person: Christopher Nelson
FTS Phone: 8-557-9380

COHORT ANALYSIS OF INCREASED RISKS OF DEATHS (CAIRD) MODEL

- Estimates human health risks produced in a population after exposure to a given radiation level

Holding Office: Office of Radiation Programs
Responsible Person: Neal S. Nelson
FTS Phone: 8-557-9380

DOSE AND RISK ASSESSMENT TABULATION (DARTAB)

- Computes fatal cancers and genetic defects from radiological concentrations on the ground surface, and in air, water, and vegetation
- Used in conjunction with RADRISK information to provide *risk assessment* information for AIRDOSE EPA and PRESTO EPA

Holding Office: Office of Radiation Programs
Responsible Person: Christopher Nelson
FTS Phone: 8-557-7380

HIGH LEVEL RADIOACTIVE WASTE-REPOSITORY RISK MODEL (REPRISK)

- Calculates expected genetic and somatic health effects at a generic high level radioactive waste geologic repository
- Estimates radionuclide releases to air, land surface, and rivers or lakes, from a repository as a result of expected and accidental events
- Accidents considered include human intrusion, faults, meteorites, and volcanoes
- Expected events include shaft and borehold leakage, and bulk rock transport
- Releases are from destruction of waste packages or disturbance of a contaminated repository backfilled tunnel

Holding Office: Office of Radiation Programs
Responsible Person: Daniel Egan
FTS Phone: 8-557-8610

LOW-LEVEL RADIOACTIVE WASTE ENVIRONMENTAL TRANSPORT AND RISK ASSESSMENT CODE (PRESTO-EPA)

- Calculates health effects to an exposed population from radioactivity escaping from a shallow land or deep geologic burial site
- DARTAB used as a subroutine to calculate fatal cancers and genetic defects
- RADRISK data required to run the model

Holding Office:	Office of Radiation Programs
Responsible Person:	G. Lewis Meyer
FTS Phone:	8-557-8610

MAXIMUM INDIVIDUAL DOSE MODEL (MAXDOSE)

- Models geological events and health effects associated with accidental releases from a nuclear waste repository
- Calculates set of dose rates at different times and distances
- Estimates contaminated areas and individual risk
- Considers leaching and dissolution as waste escapes mechanisms

Holding Office:	Office of Radiation Programs
Responsible Person:	Daniel Egan
FTS Phone:	8-557-8610

MIXTURE AND SYSTEMIC TOXICANT RISK MODEL (MSRM)

- Estimates human health risk from exposure by any route
- Non-cancer *risk assessment* models and estimation categories
- Contains statistical methods and extrapolation models for using available toxicological and epidemiological data
- Cancer risk models included for completeness, but developed elsewhere
- Applicable for single chemicals and mixtures
- Estimation methods include those in *EPA Risk Assessment Guidelines for Comparison*.

Holding Office:	Office of Health and Environmental Assessment
Responsible Person:	Richard Hertzberg
FTS Phone:	8-684-7582

PLUTONIUM AIR INHALATION DOSE (PAID)

- Calculates dose rates and doses resulting from the acute or chronic lifetime inhalation or ingestion of transuranic radioisotopes

Holding Office:	Office of Radiation Programs
Responsible Person:	Neal Nelson
FTS Phone:	8-557-9380

PRESTO-EPA

see LOW-LEVEL RADIOACTIVE WASTE ENVIRONMENTAL TRANSPORT AND RISK ASSESSMENT CODE

RADIONUCLIDE DOSE RATE/RISK (RADRISK)

- Estimates health risk due to inhalation or ingestion of radionuclides for arbitrary exposure periods
- End result in set of values relating fatal cancers and genetically significant radiation doses to a unit of radionuclide intake
- A greatly revised combination of two previously existing programs - INREM II and CAIRD
- Health risk from external exposure also estimated by CAIRD using dose rates from DOS FACTER

Holding Office:	Office of Radiation Programs
Responsible Person:	Christopher B. Nelson
FTS Phone:	8-557-9380

REPRISK

see HIGH LEVEL RADIOACTIVE WASTE REPOSITORY RISK MODEL

SLUDGE PROGRAM-HEALTH IMPACTS (SPHI)

- Assesses adverse human health effects from contaminants in sewage sludge
- Considers sludge distributed and/or marketed to public for use in vegetable gardens and lawns
- Contaminants taken into account include metals, PCBs, and pathogens

Holding Office:	Office of Solid Waste
Responsible Person:	Ken Shuster
FTS Phone:	8-382-3345

5.1.5 Multi-Media Models

ENVIRONMENTAL PARTITIONING MODEL (ENPART)

- Uses physical/chemical properties to estimate partitioning between air, water, and river sediment (i.e., estimates mass distribution between these three components).
- Estimates environmental persistence.
- Available on GEMS.

Holding Office:	Office of Toxic Substances Exposure Evaluation Division
Responsible Person:	Russell Kinerson
FTS Phone:	8-382-3928

5.2 NON-EPA MODELS

5.2.1 Atmospheric Fate Models

TEXAS CLIMATOLOGICAL MODEL CONTROL (TCM)

- Long-term (seasonal or annual)
- Gaussian dispersion
- Two pollutants per run
- Includes option for simulation of urban area turbulence classes
- Handles nonconservative pollutants

- Point or area sources
- Up to 2500 receptor locations on downwind user specific grid
- Outputs average concentration data
- Requires stability array data
- FORTRAN program language; has been implemented on Burroughs 6810/11
- Batch mode
- 17K bytes memory required
- Technical background in meteorology, air pollution useful

Documentation: Texas Air Control Board, 1980

5.2.2 Surface Water Fate Models

ESTUARY AND STREAM QUALITY MODEL (WASTOX)

- Time-varying, 3-dimensional model
- Sophisticated second-order organic decay kinetics
- Models rivers, lake and estuaries
- Very data intensive model
- User must provide hydrodynamic flows between model compartments
- Applicable to IBM 370 or PDP 11/70 systems
- Fortran IV program requires 32 K bytes storage
- Requires 150-300 man hours for setup

Documentation and Software:

Dr. John Connolly
Environmental Engineering and Science
Manhattan College
Bronx, NY 10471
(212) 920-0276

or:

Dr. Parmely H. Pritchard
Environmental Research Laboratory
Gulf Breeze, FL 32561
(904) 932-5311

FINITE ELEMENT TRANSPORT MODEL (FETRA)

- Time-varying, 2-dimensional model (longitudinal and lateral)
- Second-order decay mechanisms for organic pollutants
- Models rivers, estuaries, coastal systems, and completely mixed lakes
- Can be coupled with EXPLORE-I hydrodynamic model to generate velocities where these are unknown
- Input data requirements are extensive
- Computer program written in FORTRAN IV
- Can be used on IBM, VAX or CDC-7600 computers
- Has been field validated
- Setup and execution time requirements are large

References: Onishi et. al. 1981.
Further Information: Yasuo Onishi
Battelle-Pacific Northwest Laboratories and ICF Northwest
Richland, WA 99352
(509) 376-8302

SIMPLIFIED LAKE/STREAM ANALYSIS (SLSA)

- Steady-state, 1-dimensional model
- Solution either by desk top calculations or simple (hand calculator) FORTRAN program
- Suitable for simplified lake and river systems
- Easy to set up and use
- Computer programming not necessary; if used, only 280 bytes are required, suitable for microcomputers
- Well documented and suggested for use before using a more sophisticated model

References: HydroQual 1982
Documentation: William Gulledge
2581 M Street, N.W.
Washington, D.C. 20037
(202) 887-1183

WASTOX

see ESTUARY AND STREAM QUALITY MODEL

5.2.3 Unsaturated Zone and Ground Water Fate Models

COUPLED FLUID, ENERGY AND SOLUTE TRANSPORT (CFEST) COMBINED WITH UNSAT ID

- 3-dimensional
- Accommodates heterogeneous, anisotropic, multilayered soil configurations
- Has been field verified for arsenic and organic wastes
- Sorption, degradation mechanism not incorporated
- Handles saline aquifers as well as fresh water
- Transport mechanism of dispersion, advection simulated
- Time-variant release and flow rates
- Combination covers unsaturated and saturated zones

Documentation: Gupta et. al. 1982.

ESTAN

- One-dimensional
- Organic substances
- Degradation is simulated
- Provides pollutant velocity, distribution, and concentration data
- Accommodates various release rates, schedules
- Considered a screening model
- Rapid evaluations
- Inexpensive, easy to use; requires only hand-held calculator

- Has been field verified with pesticides

References: Enfield et. al. 1982.

FINITE-ELEMENT MODEL OF WASTE (FEMWASTE) AND FINITE ELEMENT MODEL OF WATER FLOW (FEMWATER)

- Two-dimensional
- Interzone transfer is modeled
- Incorporates convection, dispersion
- Simulates degradation of non-conservative substances
- Absorption is accounted for
- Capable of modeling layered, heterogeneous soil zones
- FEMWATER is a model for ground water flow, while FEMWASTE simulates the transport/fate of contaminants
- Has been implemented on IBM 360
- May require background in hydrogeology, differential equations, programming
- Field verified

Documentation: Yeh and Ward 1981

Information:
Dr. George T. Yeh
Oak Ridge National Laboratory
Environmental Science Division
P.O. Box X
Oak Ridge, TN 37830
(615) 574-7285

LEACHATE PLUME MIGRATION MODEL (LPMM)

- Continuous source model
- Dispersion is simulated
- Degradation processes accounted for
- A simplistic model; results may not be as sophisticated as necessary for Level III work
- Can be used in nomographic, hand-held calculator, or computer form
- Relatively easy to use

References: Kent et. al. 1982.

RANDOM WALK SOLUTE TRANSPORT MODEL (RWSTM)

- One or two-dimensional
- Time-variant release rates
- Accommodates well-injected release
- Incorporates dispersion, retardation
- Handles nonconservative pollutants
- Accounts for well pumping
- Requires mathematical programming, hydrogeological knowledge on part of user
- Has been field validated
- Provides contaminant concentration at user-selected points

Documentation: Prickett et. al. 1981.

SANDIA WASTE ISOLATION FLOW AND TRANSPORT MODEL (SWIFT)

- 3-dimensional
- Transport processes of advection, dispersion simulated
- Sorption, degradation processes accounted for
- Appropriate for waste-injection, waste-isolation modeling
- Has been field verified
- Has associated user's guide in self-teaching format
- Fortran program; has been implemented on various CDC systems including CDC 7600
- 1984 version to be released late 1984, or 1985

Documentation: Reeves and Cranwell 1981; Finley and Reeves 1978
Software: National Energy Software Center
Argonne National Laboratories
Argonne, IL 60439
Information: Intera Environmental Consultants, Inc.
11999 Katy Freeway, Suite 610
Houston, TX 77079

5.2.4 Dose-Response Models

GAMMA MULTIHIT MODEL

- Generalization of One-Hit Model
- Assumes that a response requires more than one hit (dose)
- Exhibits a greater variety of behavior than one-hit model
- Can accommodate a wider range of data than one-hit or multistage models
- Excess risk is convex for more than one hit, concave for less than one, linear for one hit
- Inconclusive for a negative or non-integer number of hits
- Resembles curves with thresholds at low levels
- May "manufacture" a background rate even with no evidence of one
- Determination of formulae for confidence intervals is problematic
- Less problematic when additive background is incorporated

References: For specific applications see the "hit theory" in Iverson and Arley, 1950 or the "particle theory" in Cornfield, 1954. The gamma multihit model is described in Chesson et al., 1984.

LOGIT MODEL

- Similar to Probit Model (see below) but approaches zero more slowly
- Low dose linearity implies a concave dose response curve at higher doses
- Extrapolations will be close to gamma-multihit model

References: Worcester and Wilson, 1943 and Berkson, 1944. A more general model of which both Probit and Logit models are special cases was proposed in Prentice, 1976. See also Chesson et al., 1984.

MULTISTAGE MODEL

- A form of the Weibull model (see below)
- Accounts for cancer death rate proportional to some power of age
- Assumes that a cell goes through a variable number of distinct stages in a specific order before becoming cancerous
- Assumes rate within each stage is constant and related to dose
- Recommended for low-*risk assessment* of cancer
- Estimation is more complicated than with other models
- Uses computer program GLOBAL 79 to calculate confidence intervals

References: Armoitage and Doll, 1961 and Crump et. al., 1976. See also Chesson et. al., 1984.

ONE-HIT MODEL

- Linear at low doses, concave at high doses (sometimes called "linear model")
- Assumes a response after a single biologically effective unit of dose
- Provides a conservative estimate of risk at low doses

References: Chesson et al., 1984.

PROBIT MODEL

- Tolerance distribution model
- Assumes tolerance to follow a lognormal distribution
- Has been used to describe "time to response" data
- Tends to give a high VSD

References: Finney, 1971. A more general model of which both Probit and Logit models are special cases was proposed in Prentice, 1976. The Probit model is described in Chesson et. al., 1984.

WEIBULL MODEL

- Tolerance distribution model suggested by human cancer incidence patterns
- Assumes cancer begins in a single cell
- Assumes individual cells in a tissue behave independently
- Accounts for external forces like death of some person in sample set by non-measured causes before cancer could be diagnosed
- Low dose linearity implies a concave dose response curve at higher doses

References: Suggested in Cook et al., 1969. See also Chesson et al., 1984.

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CHAPTER 6

MANUALS, DIRECTORIES AND PERIODICALS

This chapter presents manuals, directories, and periodicals that are useful sources of information in performing *risk assessments*. Manuals are considered documents with the purpose of giving guidance or instructions for carrying out a specific function, such as conducting public health evaluations under Superfund or using a particular modeling system. Directories are compilations of information resources, names and addresses, or chemical activity status reports. Periodicals are regularly published newsletters, bulletins, and reports that also contain information relevant to *risk assessments*.

Manuals are listed in Section 6.1, directories are presented in Section 6.2, and periodicals are in Section 6.3. Because these information resources are typically broad in scope with information that may be useful throughout the *risk assessment* process, they are not categorized according to specific *risk assessment* steps (i.e., hazard identification, dose-response assessment, exposure assessment, and risk characterization as described in Chapter 2). For each manual, directory, and periodical, a brief description of its content is given along with a full bibliographic reference or point of contact.

6.1 MANUALS

The Endangerment Assessment Handbook

This document, which was prepared and distributed by **EPA's** Office of Waste Programs Enforcement (OWPE), provides guidance to **EPA** regional, state, and contractor personnel on conducting endangerment assessments and preparing the necessary documentation. Its primary purpose is to assist individuals in the preparation of endangerment assessment documents to satisfy enforcement needs. The handbook explains the use of endangerment assessment as an enforcement tool, its relationship to other documents which may be prepared for a specific site, and instructions for preparing the endangerment assessment document.

Reference:	PRC Engineering. 1985. Submitted to the Office of Waste Programs Enforcement, U.S. **EPA**.,
Contract No.:	68-01-7037.

Graphical Exposure Modeling System (GEMS) User's Guide

This handbook describes the GEMS, an interactive computer system developed in the Exposure Evaluation Division of the Office of Toxic Substances. The purpose of the document is to describe GEMS from the user's point of view. It is intended to serve as a comprehensive guide to the use of GEMS by personnel without great knowledge of computer programming.

Reference:	General Software Corporation. 1984. Submitted to the Office of Pesticides and Toxic Substances, U.S. **EPA**.
Contract No.:	68-01-6618.

Guidance on Feasibility Studies Under CERCLA

This document provides guidance for the preparation of feasibility studies required under the revised National Oil and Hazardous Substances Pollution Contingency Plan. It provides project managers and decision makers in government and industry with guidelines for developing and evaluating alternative remedial responses to uncontrolled releases of hazardous substances. In conjunction with other publications in this series, it will assist in meeting the national goal of adequately protecting public health, welfare, and the environment.

Reference:	U.S. **EPA**, 1985. *Guidance on Feasibility Studies Under CERCLA.* Office of Emergency and Remedial Response, Washington, D.C.

Guidance on Remedial Investigations Under CERCLA

This document provides guidance on the conduct of remedial investigations in support of feasibility studies under Superfund and the National Contingency Plan. Essential steps in the remedial investigation process are described and the document identifies important factors, information, and analysis needs to scope the investigations; prepare all necessary plans (health and safety, sampling, data management); conduct the site assessment; and evaluate and present results. The guidance document provides government and private personnel with the means to plan, prepare, conduct, and conclude remedial investigations consistent with hazardous waste site clean-up legislation and site-specific requirements.

Reference:	U.S. **EPA**, 1985. *Guidance on Remedial Investigations Under CERCLA.* Office of Emergency and Remedial Response, Washington, D.C.

A Manual for the Preparation of Engineering Assessments

The manual contains models used by the Office of Toxic Substances Chemical Engineering Branch to assess occupational exposure and environmental releases.

Reference:	William Burch, Chemical Engineering Branch, Economics and Technology Division, U.S. **EPA** Office of Toxic Substances
Telephone:	FTS 382-3664

OTS Exposure Assessment Manuals

EPA's Office of Toxic Substances (OTS) has developed a series of manuals outlining methods for assessing exposure to chemical substances. The series consists of five volumes, the first providing an introduction to the overall exposure assessment process and, as noted by the following references, subsequent volumes pertain to exposure assessments conducted for different purposes.

References:	Callahan, et. al., 1985. *Methods for Assessing Exposure to Chemical Substances,* Vol. 1: Introduction. **EPA** 560/5-85-001. NTIS PB 86-107083.

Freed, et. al., 1985.
Methods for Assessing Exposure to Chemical Substances, Vol. 2:
Methods for Assessing Exposure to Chemical Substances in the Ambient Environment.
EPA 560/5-85 002. NTIS PB 86-107067

Adkins, et. al., 1985.
Methods for Assessing Exposure to Chemical Substances, Vol. 3:
Methods for Assessing Exposure from Disposal of Chemical Substances.
EPA 560/5-85-003. NTIS PB 86 107059

Dixon, et. al., 1985a.
Methods for Assessing Exposure to Chemical Substances, Vol. 4:
Methods for Enumerating and Characterizing Populations Exposed to Chemical Substances.
EPA 560/5-85 004. NTIS PB 86 107042

Dixon, et. al., 1985b.
Methods for Assessing Exposure to Chemical Substances, Vol. 5:
Methods for Assessing Exposure to Chemical Substances in Drinking Water.
EPA 560/5-85-005. NTIS PB 86 132156

Shultz, et. al., 1985.
Methods for Assessing Exposure to Chemical Substances, Vol. 6:
Methods for Assessing Occupational Exposure to Chemical Substances.
EPA 560/5-85-006. (NTIS PB number to be assigned.)

Superfund Exposure Assessment Manual

This manual presents an integrated methodology designed to guide the execution of four major component analyses required in support of *Superfund* site Remedial Investigations and Feasibility Studies: (1) analysis of toxic contaminant releases from a subject site; (2) determination of the environmental fate of such contaminants; and (3) evaluation of human population exposure. The first three analyses are conducted as components of the site Remedial Investigation. The last is executed as part of the Feasibility Study.

Reference:	Versar, Inc., 1986. Submitted to the Office of Toxic Substances, Exposure Evaluation Division, U.S. **EPA**.
Contract Numbers:	68-01-6271,
Task No.:	59; 68-03-3149,
Work Assignment No.:	23-2

Superfund Public Health Evaluation Manual

This manual establishes a framework for analyzing public health risks at Superfund sites and for developing design goals for remedial alternatives that are based on applicable or relevant and appropriate requirements of other laws, where available, or risk analysis where those requirements are not available. These procedures were developed by **EPA's** Office of Emergency and Remedial Response in conjunction with an Agency-wide Working Group, which included representatives from the program offices, the Office of Research and Development, the Office of Policy, Planning and Evaluation, and several Regional offices. The procedures provided in the manual are designed to conform to **EPA's** *risk assessment* guidelines. The manual provides a range of analytical requirements that may be needed at a particular site.

Reference:	U.S. **EPA**. 1986. Office of Emergency and Remedial Response. Submitted by ICF Inc. under Contract Number: 68-01 7090

Toxicology Handbook, Principals Related to Hazardous Waste Site Investigation

This handbook describes the processes and procedures involved in collecting and interpreting the information needed to perform a toxicity assessment as part of a *risk assessment*. It is prepared and distributed by the **EPA's** Office of Waste Programs Enforcement. The handbook is intended to provide an introduction to the toxicity assessment process and some of the major elements involved.

Reference:	PRC Engineering. 1985. Submitted to the Office of Waste Programs Enforcement, U.S. **EPA**.
Contract No.:	68-01-7037

The Use of Risk Assessment in EPA Regional Operations

This report examines the nature and use of *risk assessment* in U.S. **EPA** Regional operations. The report was done to clarify what the term "*risk assessment*" means in the context of current Regional policies and procedures. It focuses on the use of *risk assessment* to estimate human health impacts from toxic chemical exposures in site-specific situations. It is based on a survey of regulatory programs at a "typical" Regional office - Region IV, located in Atlanta, Georgia. From the survey results, the step-by step process involved in site-specific *risk assessment* is defined. The report also presents recommendations for ensuring the scientific quality and consistency of site specific *risk assessments*.

Reference:	U.S. **EPA**. November 1985. Region 4. **EPA** 904/5-85 140.

User Guide to Chemical Activity Status Report (CASR)

This manual describes the scope and organization of information contained in CASR as well as the basic search and display techniques. The manual also lists some sample searches done on specific chemicals and shows displays from the searches.

Reference:	Computer Sciences Corp. 1985. Prepared by **EPA** CIS User Support Group.
Contract No.:	6639-151.

6.2 DIRECTORIES

Chemical Activities Status Report, Fourth Edition, Volumes I & II

These reports summarize **EPA's** chemical related activities. The reports are organized into three sections which include 1) an alphabetized chemical name reference listing; 2) a chemical name synonym list, and; 3) an **EPA** chemical activities report arranged sequentially by CAS Registry Number. It is prepared and distributed by the Chemical Policy and Coordination Staff of OTS.

Reference:	U.S. **EPA**. 1985. Prepared by Chemical Coordination Staff of the Office of Toxic Substances. February.

Directory of Online Data Bases

This publication provides brief summaries of 2764 data bases and files available through online services. Brief introductory material about online data base services is also included. Online services are indexed by telecommunication networks through which they are available.

Reference:	Cuadia Associates, Inc. 1985 (Vol. 6, Number 3).
LC Catalog No.:	79-54776. Santa Monica, CA

Groundwater Management: The Use of Numerical Models, 2nd Edition

This monograph discusses ground-water models and their applications in the management of water resource systems. The kinds of models that have been developed, their availability, data and technical expertise requirements and their specific and general roles in ground water management are discussed. The first chapters are dedicated to brief reviews of ground water systems, ground-water management, and the basic mathematics equations used in ground water modeling. The appendix contains a comprehensive list of models, a bibliography and a list of model contact addresses.

Reference:	Paul van der Heijde, Yehuda Bachmat, John Bredehoeft, Barbara Andrews, David Holz, and Scott Sebastian. 1985. *American Geophysical Union Water Resources Monograph 5.* American Geophysical Union, Washington, D.C.

Industry Program Interaction Matrix; A Guide to Agency Personnel Who Are Familiar with Selected Industries

This document identifies headquarters and regional/ lab personnel who may have current information concerning specific segments of industry. The document contains a matrix which lists 81 industry categories and their subcategories, along with the name, phone number, and organization of the **EPA** personnel who are responsible for that category or subcategory. Report is prepared and distributed by the Chemical Coordination Staff of the Office of Pesticides and Toxic Substances.

Reference:	U.S. **EPA**. 1984. Prepared by Chemical Coordination Staff of the Office of Pesticides and Toxic Substances. June.

Information Resources in Toxicology

This book is a succinct guide to major sources of information in the field of toxicology. It deals with sources relevant to chemical, physical and biological hazards to man, although the chemical hazards have been emphasized. Brief descriptions are provided for books, special monographs, popular literature, periodicals, journal articles, abstracts, data bases, organizations, relevant legislation and regulations, educational institutions, and other directories. Although the book focuses on toxicology in the United States, one chapter is devoted to International Activities. Appendices include a directory of poison control centers and a list of selected abbreviations.

Reference: Phillip Wexler, 1982.
Elsevier Publishing Co. Inc.,
New York

NIOSH Publication Catalog

This publication is a cumulative catalog of all National Institute for Occupational Safety and Health (NIOSH) numbered publications, hazard evaluation and technical assistance reports, contract reports, industry-wide study reports, control technology reports, and miscellaneous reports (educational and training materials). The publications listed are generally not available from NIOSH and must be purchased from the Government Printing Office (GPO) or the National Technical Information Service (NTIS). Instructions for ordering from GPO and NTIS are provided.

Reference: U.S. Dept. of Health and Human Services (Sixth edition). 1984.
OHHS (NIOSH) Publication No.: 84-118

NTIS Directory of Computerized Data Files

This publication provides current information on the availability and content of Federal, machine-readable data files which are available from NTIS. Technical reports are not described. Data file abstracts are presented in sections for Economics, Social Sciences and Science and Technology. Data files are also indexed by agency, as well as NTIS order number and subject. All of the data files listed are available for purchase from NTIS.

Reference: U.S. Department of Commerce. 1985.
PB 85-155174

ORD Topical Directory

This directory provides a comprehensive alphabetical listing of areas in which the **EPA** Office of Research and Development has technical expertise. The individuals who are active in these areas are listed along with telephone numbers, office locations, and, if applicable, laboratory locations.

Reference: U.S. **EPA**.
Office of Research and Development/Office of Research Planning and
Management/Center for Environmental Research Information (CERI)

OTS Information Architecture Notebook

This handbook was originally prepared for internal uses within the **EPA** Office of Toxic Substances (OTS). The handbook contains information on data bases and reference materials which are useful in the review and analysis of the effects of chemical substances on human health and the environment.

Reference: U.S. **EPA**. 1983.
Report prepared by Office of Toxic Substances.
Contract No.: 68-01-6651.

The Federal Data Base Finder

This publication identifies over 3,000 free and fee-based databases and files available from the Federal Government. It is divided into sections for government controlled data bases (searchable directly through Federal Agencies); commercial data bases (containing government supplied data available through commercial vendors); and government data files and tapes (sold to the public from various organizations and departments).

Reference: Zaronzny, Sharon and Monica Honer. 1984 (1984-5 Edition).
Information USA
Potomac, MD

The Status of Chemicals in the Special Review Program Registration Standards Program, and Data Call-In Program

This report contains a listing of all chemicals which have been, or are being handled under the Special Review Process; an alphabetical listing of chemicals active in the Registration Standard Development Process; and identification of the chemicals which are processed in the Data Call-In program. The lists of chemicals are maintained and distributed by the Office of Pesticides Programs and are updated semi annually.

Reference: U.S. **EPA**. 1985.
Prepared by the Office of Pesticide Programs on a semi-annual basis.

6.3 PERIODICALS

Accomplishments Under the New Chemical Program

This bulletin is an annual summary of actions taken under Section 5 of TSCA. It contains a listing of the formal and informal regulatory actions, as well as the Premanufacturing Notifications (PMN's) withdrawn. Each PMN entry includes a brief description of the Agency's findings on the potential risk of the chemical, the types of toxic data reviewed, the action taken by **EPA**, and the final disposition of the PMN.

Reference: U.S. **EPA**,
Chemical Control Division
Contact: Wendy Cleland-Hammett,
FTS Phone: 8-382-3784

Chemicals-in-Progress Bulletin

The Office of Toxic Substances (OTS) publishes the above, which summarizes developments within OTS pertaining to the Toxic Substance Control Act (TSCA). Information within the Bulletin includes current as well as near term plans. The Bulletin is published on a monthly basis.

Reference: U.S. **EPA**.
Office of Toxic Substances,
TSCA Assistance Office (TS-799)
Phone: (800) 424-9065

CIS News

CIS News, published by Chemical Information Systems (CIS), Inc., is a monthly newsletter tailored specifically to developments, updates and future plans within CIS. The information contains notes on data bases, meetings, seminars, and major company events.

Reference: Chemical Information Systems, Inc.
7215 York Road
Baltimore, MD 21212

Existing Chemicals Assessment Division (ECAD) Quarterly Report

This report summarizes the status of all chemicals in the OTS assessment process. The reports are designed for internal OTS purposes. An abbreviated, tabular version of the *Quarterly Report* is also published every two months as the *Bi-Monthly Assessment Report.*

Reference: U.S. **EPA**,
Existing Chemicals Assessment Division
Contact: Jeanette Wiltse,
FTS Phone: 8-382-3832

Office of Toxic Substances (OTS) Report Bibliographies

The Information Management Division maintains bibliographies of OTS publications. These are updated on a periodic basis.

Reference: U.S. **EPA**,
Information Management Division
Contact: Geraldine Nowak,
FTS Phone: 8-382-3568

Risk Assessment Review

This publication intends to serve as a forum for information exchange on *risk assessment* activities and developments. The Review is the product of a cooperative effort between the Office of Research and Development and the Regional Risk Assessment Network. The information covered includes reviews of current and future programs related to *risk assessment*. It is published on a monthly basis.

Reference: U.S. **EPA**,
Office of Health and Environmental Assessment,
Office of Research and Development
To be added to the mailing list, contact:
CERI Distribution,
26 W. St. Clair,
Cincinnati, OH 45268

Toxic Substances Control Act (TSCA) Annual Report

This report summarizes **EPA's** activities under TSCA during the last current fiscal year, and includes not only direct rule making activities, but also such items as data collection procedures, risk evaluation strategies, rule making processes, policy statements, enforcement activities, and any litigation. There have been 8 annual reports since TSCA took effect in January, 1977, fulfilling the Congressional reporting requirements under sections 9(d), 28(c), and 30 of the Act.

Reference: U.S. **EPA**,
Office of Program Management and Evaluation
Contact: Brenda Kover,
FTS Phone: 8-382-3784

CHAPTER 7

PUBLICATIONS

Bibliographic references to general literature, textbooks, and other publications that are useful *risk assessment* information resources are listed in this chapter. Specifically-cited and titled publications and more generically-referenced resources are included in Sections 7.1 and 7.2 respectively. Although the publications itemized in Section 7.1 are generally applicable to more than one step in the *risk assessment* process, these specifically-cited publications are grouped with those related to hazard identification in Section 7.1.1; publications related to dose-response assessment in Section 7.1.2; exposure assessment publications in Section 7.1.3; and publications related to risk characterization in Section 7.1.4. Chapter 2 of this **Directory** describes the purpose of these different *risk assessment* steps and the types of information needed to accomplish each. The generically referenced resources in Section 7.2 may contain various individual components under each title and are thus too broad in their applications to be placed into one specific section.

The publications listed below are identified, through interviews with **EPA** and **non-EPA** employees, as commonly used *risk assessment* references or were extracted from publication lists from other known documents related to *risk assessment*. Additional bibliographic references for specific exposure assessment and dose-response models are given in Chapter 5, and additional references for manuals and directories are given in Chapter 6.

7.1 SPECIFIC CITATIONS

7.1.1 Publications Related to Hazard Identification

Browning E., 1979.
Toxicity of Industrial Metals. New York:
Appleton-Century-Crofts.

Clayton, G.D., and Clayton, F.E., eds., 1981.
Patty's Industrial Hygiene and Toxicology.
John Wiley & Sons, New York, 3rd edition.

Dawson, et al., 1980.
Physical/Chemical Properties of Hazardous Waste Constituents.
Prepared by Southeast Environmental Research Laboratory for **U.S. EPA**.

Food and Drug Administration, 1970.
Radiological Health Handbook
Bureau of Radiological Health
Rockville, Maryland.

GCA Corporation, 1982.
Evaluation and Selection of Models for Estimating Air Emissions from Hazardous Waste Treatment, Storage, and Disposal Facilities.
Prepared for *U.S. EPA*,
Office of Solid Waste,
Washington, D.C.

Gosselin, R.E., Smith, R.P., and Hodge, H.C. 1984.
Clinical Toxicology of Commercial Products.
Williams & Wilkins, Baltimore, 5th Ed.

Grain, C.F., 1982.
Vapor Pressure.
Chapter 14 in Lyman et al., *Handbook of Chemical Property Estimation Methods,*
McGraw-Hill, 1982.

IARC Monographs on the Evaluation of Carcinogenic Risk of Chemicals to Humans.
International Agency for Research on Cancer,
Lyon, France (continuing series).

Kirk-Othmer Encyclopedia of Chemical Technology, 1978.
John Wiley & Sons, Inc.,
New York, 3rd Ed.

Lyman, et al., 1982.
Handbook of Chemical Property Estimation Methods.
McGraw-Hill, New York

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National Institute for Occupational Safety and Health.
Publication No.: 78-210

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Office of Research and Development,
U.S. Environmental Protection Agency,
Athens, GA
EPA 600/6-82-004 a and b.

Perry, R.H. and Chilton, C.H., eds., 1983.
Chemical Engineers' Handbook,
McGraw-Hill, 5th Ed.

Plunkett, E.R., 1976.
Handbook of Industrial Toxicology.
Chemical Publishing Co., Inc.
New York

RTECS (Registry of Toxic Effects of Chemical Substances).
NIOSH (published annually)

Sax, N.I., 1984.
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Van Nostrand Reinhold Co.
New York

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The Johns Hopkins University Press
Baltimore, MD

U.S. Environmental Protection Agency, 1980a.
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Office of Water Regulations and Standards
NTIS PB 81-117251, for entire set

U.S. Environmental Protection Agency, 1980b.
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Federal Register 45:79318-79379

U.S. Environmental Protection Agency, 1981.
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Office of Research and Development,
EPA 600/2-82-001a. NTIS PB 80 223050

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Technical Support Document and Summary Table for the Ranking of Hazardous Chemicals Based on Carcinogenicity, External Review Draft.
Office of Health and Environmental Assessment.
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U.S. Environmental Protection Agency, 1984.
Characterization of Constituents from Selected Waste Streams Listed in 40 CFR Part 261.
Office of Solid Waste
Prepared by Environ Corporation

U.S. Environmental Protection Agency, 1985a.
Proposed Maximum Contaminant Levels for Volatile Synthetic Organic Chemicals in Drinking Water.
Federal Register 50(219)46902-46933

Verschueren, K., 1983.
Handbook of Environmental Data for Organic Chemicals.
Van Nostrand Reinhold Co.,
New York, 2nd ed.

Weast, R.C., ed., 1979.
CRC Handbook of Chemistry and Physics.
CRC Press, Inc.
Boca Raton, FL

Windholz et al., ed., 1983.
The Merck Index.
Merck & Company, Inc.,
Rahway, New Jersey, 10th ed.

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McLaughlin, T., 1984.
Review of Dermal Absorption.
EPA-600/8-84-033. NTIS No. PB85-170694

International Commission on Radiological Protection (ICRP), 1968.
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ICRP Publication 10
Pergamon Press,
New York.

U.S. Environmental Protection Agency, 1986a.
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U.S. Environmental Protection Agency, 1986b.
Guidelines for Exposure Assessment.
Federal Register 51:34042-34054

U.S. Environmental Protection Agency, 1986c.
Guidelines for Mutagenicity Risk Assessment.
Federal Register 51:34006.34012

U.S. Environmental Protection Agency, 1986d.
Guidelines for the Health Assessment of Suspect Developmental Toxicants.
Federal Register 51:34028:34040

U.S. Environmental Protection Agency, 1986e.
Guidelines for the Health Risk Assessment of Chemical Mixtures.
Federal Register 51:34014-34025

U.S. Environmental Protection Agency, 1985a.
Health Effects Assessment for [Specific Chemical].
[Note: 58 individual documents available for specific chemicals or chemical groups.]
NTIS PB 86-134111, for entire set

U.S. Environmental Protection Agency, 1985b.
Relative Carcinogenic Potencies among 54 Chemicals Evaluated by the Carcinogen Assessment Group as Suspect Human Carcinogens.

U.S. Environmental Protection Agency, 1984.
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EPA-600/8-85-010. NTIS No. PB85-242667/AS

Basta, D.J. and Bower, B.T., 1982.
Analyzing Natural Systems Resources for the Future.
Washington, D.C.

Bureau of the Census, 1984.
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Callahan, et al., 1979.
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Volumes I and II,
Office of Water Planning and Standards,
Office of Water and Waste Management,
U.S. **EPA**,
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Cowherd, Chatten, et. al., 1985.
Rapid Assessment of Exposure to Particulate Emissions from Surface Contamination Sites.
NTIS No.: PB192219/AS. **EPA**-600/8-85-002

Cupitt, L.T., 1980.
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Environmental Sciences Research Laboratory, ORD,
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Dawson, Gaynor et. al., 1985.
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Modeling the Fate of Chemicals in the Aquatic Environment.
Ann Arbor Science

Donigian, A., et. al., 1983.
Rapid Assessment of Potential Groundwater Contamination Under
Emergency Response Conditions.
EPA 600-8-83-030. NTIS No.: PB84-133123

Fiserova-Bergerova, Vera, 1983.
Modeling of Inhalation Exposure to Vapors: Uptake, Distribution and Elimination. Volume I.
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Boca Raton, FL

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New York

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Am. Ind. Hyg. Assoc. J. (42),
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Office of Health and Environmental Assessment,
U.S. EPA,
Washington, D.C.
EPA 600/6-84-009

Kenaga, E.E. and Goring, C.A.I., 1978.
Relationship Between Water Solubility, Soil Sorption, Octanol/Water Partitioning, and Bioconcentration of Chemicals in Biota.
In: *Aquatic Toxicology*, ASTM STP 707, J.G. Eaton, P.R. Parrish, and A.C. Hendricks, Eds.
American Society for Testing and Materials,
Philadelphia, PA

Kimbrough, R. et al., 1984.
Health Implications of 2,3,7,8 TCDD Contamination of Residential Soil.
J. of Tox. and Env. Health. Vol. 14, No. 1.

Mabey, et al., 1982.
Aquatic Fate Process Data for Organic Priority Pollutants.
Prepared by SRI International,
EPA Contract Nos.: 68-01 3867 and 68-03-2981,
Prepared for Monitoring and Data Support Division,
Office of Water Regulations and Standards,
Washington, D.C.

Maki, A.W., Dickson, K.L., and Cairns, J., eds., 1980.
Biotransformation and Fate of Chemicals in Aquatic Environments.
American Society for Microbiology,
Washington, D.C.

Menzer, R.E. and Nelson, J.O., 1980.
Water and Soil Pollutants.
Chapter 25 in Doull, J., Klaassen, C.D., and Amdur, M.D., Toxicology,
MacMillan, 1980.

National Academy of Sciences, 1977.
Drinking Water and Health. Volume I.
NRC Press,
Washington, D.C.

National Academy of Sciences, 1980.
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Nelson, D.W., Elrick, D.E., Tangi, K.K., Kral, D.M., and Hawkins, S.L., eds., 1983.
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Research Triangle Park, NC

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Office of Solid Waste
Prepared by Environ Corporation

U.S. Environmental Protection Agency, 1980.
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Walton, W.E., 1985.
Practical Aspects of Ground Water Modeling.
National Water Well Association,
Worthington, OH

Whitmore, R.W., 1985.
Methodology for Characterization of Uncertainty in Exposure Assessments.
EPA-600/8-85-009. NTIS No. PB85 240455/AS

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National Academy Press. 1985.
Risk Assessment in the Federal Court. Managing the Process.
Committee on the Institutional Means for Assessment of Risks to Public Health,
Commission on Life Sciences,
National Resource Council

Schaum, J., 1984.
Risk Analysis of TCDD Contaminated Soil.
EPA 600/8 84-031. NTIS No. PB85 145704/AS

U.S. Environmental Protection Agency, 1986a.
Guidelines for Carcinogen Risk Assessment.
Federal Register 51:33992-34003

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Guidelines for Exposure Assessment.
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U.S. Environmental Protection Agency, 1986c.
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Federal Register 51:34006-34012

U.S. Environmental Protection Agency, 1986d.
Guidelines for the Health Assessment of Suspect Developmental Toxicants.
Federal Register 51:34028-34040

U.S. Environmental Protection Agency, 1986e.
Guidelines for the Health Risk Assessment of Chemical Mixtures.
Federal Register 51:34014-34025

U.S. Environmental Protection Agency, 1985a.
Proposed Rule: National Oil and Hazardous Substances Pollution Contingency Plan.
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U.S. Office of Science and Technology Policy, 1985b.
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Prepared by the Exposure Assessment Group,
Office of Health and Environmental Assessment,
Washington, D.C.,
EPA 600/8-84 031

U.S. Environmental Protection Agency, 1984b.
Risk Assessment and Management: Framework for Decision Making.
EPA-600/9-85-002

Zamuda, C.D., 1986.
The Superfund Record of Decision Process: Part 1, The Role of Risk Assessment.
Chemical Waste Litigation Reporter,
11(6):847 859

7.2 GENERAL REFERENCES TO PUBLICATIONS

Chemical Advisories

These advisories are nonregulatory informational documents, intended to encourage voluntary risk-reduction actions by individuals or organizations in instances where regulatory control is not appropriate or as interim measures while regulatory action is pursued. They provide information to the public on the toxic effects of chemicals of concern, routes of exposure, and alternative methods of reducing risks.

Contact:	Jeannette Wiltse, Existing Chemicals Assessment Division, U.S. EPA.
FTS Phone:	8-382-3832

Chemical Hazard Information Profiles (CHIPs)

CHIPs are summaries of readily available information on the health and environmental effects as well as the exposure potential of a chemical. Various chemicals reviewed in the risk identification phase of the existing chemical review process are chosen for a CHIP. Information for a CHIP is gathered from various literature sources, data bases, companies, and other government agencies. To date, 240 CHIPs have been prepared.

Contact:	James Darr, Existing Chemicals Assessment Division, U.S. EPA.
FTS Phone:	8-382-3470.

Current Awareness Reports

OTS prepares these reports from its continuous surveys of published literature. The reports are intended to identify potentially significant risks and to document current knowledge of the cancer-causing ability of each class of chemicals believed to have such effects.

Contact:	Joseph Arcos, Existing Chemicals Assessment Division, U.S. EPA.
FTS Phone:	8-382-3478.

Environmental Effects Assessment Documents

This resource is a compendium of procedures which the Environmental Effects Branch employs to evaluate the environmental effects of chemicals.

Contact:	James Gilford, Health and Environmental Review Division, U.S. **EPA**.
FTS Phone:	8-382-4237.

Health Effects Assessment Documents (HEAs)

HEAs summarize and evaluate information relevant to a preliminary interim assessment of adverse health effects associated with individual chemicals. The intent in these assessments is to suggest acceptable exposure levels whenever sufficient data are available. Whenever possible, two categories of exposure levels are estimated for systemic toxicants (toxicants for which cancer is not the endpoint of concern). The first, the AIS or acceptable intake subchronic, is an estimate of an exposure level that would not be expected to cause adverse effects when exposure occurs during a limited time interval. The second, the acceptable intake chronic (AIC), is similar in concept to the acceptable daily intake. AIC's estimate exposure levels that would not be expected to cause adverse effects when exposure occurs for a significant portion of an individual's lifespan. HEAs are subject to **EPA's** peer and administrative review process. In total, over 58 individual documents are available for specific chemicals or chemical groups.

Contact:	Craig Zamuda, Office of Emergency and Remedial Response, Policy Analysis Staff,
FTS Phone:	8-382-2201

HERD Science Issue Papers

These documents address some of the important issues which OTS encounters in evaluating the risk of chemicals or determining the need for testing. The papers include such issues as how to interpret various test data and how to determine the combination of tests that will yield the most cost effective, high quality data. To date, approximately 6 *Science Issue Papers* have been prepared.

Contact:	C.C. Lee, Health and Environmental Review Division, U.S. **EPA**.
FTS Phone:	8-382-4241

Industrial Process Profiles

These documents support the premanufacturing notification (PMN) review process by describing the manufacturing processes which use a compound under consideration, the actual materials used in each process, worker exposure to the compound, and waste disposal and relevant technology.

Contact:	Craig Matthiessen, Economic and Technology Division, U.S. **EPA**.
FTS Phone:	8-382-3694

Industrial Process Profiles for Environmental Use

These reports present the Chemical Engineering Branch's evaluation of ways to predict the release potential for different chemical handling processes. These documents are also utilized during the new chemical Premanufacturing Notification (PMN) review process. To date, 9 process release documents have been prepared.

Contact: Larry Longanecker,
Economic and Technology Division,
U.S. **EPA**.
FTS Phone: 8-382-7971.

Interagency Testing Commission (ITC) Information Reviews

These papers document the reviews of chemicals which ITC conducts in deciding whether or not to recommend them for testing. These reviews contain the following types of information: physical and chemical properties; exposure data; biochemical, toxicological, and environmental information; and observations in humans. To date, approximately 500 chemicals or groups of chemicals have undergone initial reviews by ITC and of these about 100 have been recommended for test rules development.

Contact: Robert Brink,
Interagency Testing Committee,
FTS Phone: 8-382-3915.

Production/Exposure Profiles

These documents are used both to support the new chemical review process and to provide inputs into the CHIP reports. A profile of a particular chemical contains the following types of information: production; manufacturing and processing methods; intermediate and end uses; monitoring data; human and animal exposure; disposal; names and locations of manufactures and processors; and environmental fate. As of January 1986, 210 profiles have been prepared.

Contact: Robert E. Lee,
Economic and Technology Division,
U.S. **EPA**.
FTS Phone: 8-382-3703.

Risk Assessments and Precursor Documents

These reports are developed through OTS's *risk assessments* of chemicals of potential regulatory concern. Each of these assessments is made up of numerous component analyses (e.g., exposure assessment, hazard assessment, etc.) and may go through numerous versions. None of the component assessments have ever been released by OTS and only two or three of the one to two dozen *risk assessments* have been released (in conjunction with proposed regulatory actions).

Contact: Jeannette Wiltse,
Existing Chemicals Assessment Division,
U.S. **EPA**.
FTS Phone: 8-382-3832

Section 8(e) and For Your Information (FYI) Status Reports

Status reports are prepared from all Section 8(e) notifications and FYI submissions. Each report contains the CAS number, chemical name, information type, or submission number and the OTS evaluation of the significance of the submissions, including any recommended follow-up. As of January 1986, there are status reports for 580 Section 8(e) submissions and a few more on the 470 FYI's.

Contact:	David Williams, Existing Chemicals Assessment Division, U.S. **EPA**.
FTS Phone:	8-382-3468

Technical Support Documents

These documents support the significant rule-makings undertaken by OTS by providing evaluative information. They address such topics as the technical basis for the action, the projected economic and regulatory impacts, and other areas upon which OTS seeks comment.

Contact:	Deborah Williams, Information Management Division, U.S. **EPA**.
FTS Phone:	8-382-3598

CHAPTER 8

HUMAN RESOURCES: OFFICES AND PERSONNEL

There will be occasions when the traditional information resources detailed in the previous chapters of this **Directory** will not contain the data required to characterize risks. At those times it may be helpful to access particular **EPA** offices, or **non EPA** individuals experienced with the problem area. Toward this end, this chapter lists **EPA** individuals or offices that have been identified as being likely sources of unique information or advice concerning risk characterizations. It should be emphasized that individuals listed have consented to the inclusion of their names under the understanding that they will be contacted only when all other information resources have proven to be inadequate.

8.1 REGIONAL

EPA's Regional Network for Risk Assessment Issues was developed two years ago. The following people are designated by Regional Administrators to serve as primary contacts for participating in agency wide *risk assessment* initiatives. Many of them also chair their Region's cross-media committee for addressing toxic chemical exposure issues, so they have an overall perspective on *risk assessment* activities in their Region. Susan Deihl or Earl Bozeman should be contacted for further information, Region IV, FTS 257-3776.

Region I

Tom D'Avanzo
Chairman, Toxics Coordinating Committee
Air Management Division
John F. Kennedy Federal Building
Room 2203
Boston, MA 02203
FTS 223-4864

Region II

Kevin Bricke, Chief
FTS 264-4296
Policy and Program Integration Branch
26 Federal Plaza
Room 900
New York, NY 10278

Maria Pavlova, M.D., Ph.D.
FTS 264-1918
Office of Emergency and Remedial Response
26 Federal Plaza
New York, NY 10278

Region III

Greene A. Jones, Director
FTS 597-9378
Environmental Services Division
841 Chestnut Street
Philadelphia, PA

Region IV

John A. Little
FTS 257-4727
Deputy Regional Administrator
FTS 257-4727
345 Courtland Street, N.E.
Atlanta, GA 30365

Susan Deihl
FTS 257-3776
Risk Assessment Coordinator
Office of Policy and Management
345 Courtland Street, N.E.
Atlanta, GA 30365

Ila Cote, Toxicologist
FTS 629-5645
(Mail Drop 12)
Office of Air Quality Planning and Standards
Research Triangle Park, NC 27711

Region V

David Dolan (5H-13)
FTS 886-5518
Pesticides and Toxic Substances Branch
Environmental Services Division
230 South Dearborn Street
Chicago, IL 60604

Region VI

Jim Bob Sales (6AWH)
FTS 729-9722
Hazardous Materials Branch
1201 Elm Street
Dallas, TX 75270

Jill Lyons
FTS 729-9187
Toxics Coordinator
Air Branch
1201 Elm Street
Dallas, TX 75270

Region VII

William W. Rice
FTS 757-2800
Deputy Regional Administrator
726 Minnesota Avenue
Kansas City, KS 66101

Bob Fenemore
FTS 757-2835
Air and Toxics Division
726 Minnesota Avenue
Kansas City, KS 66101

Region VIII

Jim Baker (8AW-WM)
FTS 564-1524
Air and Waste Management Division
One Denver Place
Denver, CO 80202-2413

Suzanne Wuerthele, Toxicologist
FTS 564-1743
(8AT-TS)
One Denver Place
Denver, CO 80202-2413

Region IX

Arnold Den
FTS 454-7487
Senior Science Advisor
Office of Policy and Management
215 Freemont Street
San Francisco, CA 94105

Region X

Gary O'Neal, Director
FTS 399-1152
Air & Toxics Division
1200 Sixth Avenue
Seattle, WA 98101

Dr. Dana Davoli, Toxicologist
FTS 399-1757
1200 Sixth Avenue
Seattle, WA 98101

In addition to the Regional Network for Risk Assessment Issues outlined above, there is also a Health Assessment Network which is a group of **EPA** staff who are involved in various aspects of health/*risk assessment* and have informally agreed to help each other find answers to specific technical questions related to *risk assessments*. The range of specialties represented in the network is quite broad -- exposure assessment, PCBs, ground-water contamination, general toxicology, and statistics, to name a few. As of early 1986, there were about 50 **EPA** staff members in the Health Assessment Network, with representatives from all the regional offices, headquarters, and several field components. There were also about 20 people in the network who represent external organizations such as state health departments, state environmental protection organizations, and private contractors. For more information about the Health Assessment Network, contact Suzanne Wuerthele, Region VIII, FTS 564-1743.

The following **EPA** Regional personnel are designated contacts for air toxics questions (only names and telephone numbers are given below; the addresses for regional offices are given above for the *risk assessment* contacts).

Region I

Margaret McDonough
(617) 223-4870; FTS 223-4870

Beth Hasset
(617) 223-4880; FTS 223-4880

Region II

Bob Kelly
(212) 264-2517; FTS 264-2517

Region III

I. Milner
(215) 597-9090; FTS 597-9090

Paul Racette
(215) 597-9009; FTS 597-9009

Region IV

Doug Cook
(404) 347-2864; FTS 247-2864

Region V

Harriet Croke
(312) 353-6009; FTS 353-6009

Region VI

Jill Lyons
(214) 767-9187; FTS 729-9187

Region VII

Bob Chanslor
(913) 236-2893; FTS 757-2893

Region VIII

Dewitt Baulch
(303) 293-1761; FTS 564-1761

Region IX

Tim Smith
(415) 974-8219; FTS 454-8219

Region X

Dana Davoli
(206) 442-1757; FTS 399-1757

8.2 HEADQUARTERS

U.S. Environmental Protection Agency

401 M Street, N.W.
Washington, D.C. 20460
Locator Phone No.: FTS 8-382-2090

Office of Emergency and Remedial Response

Craig D. Zamuda, Ph.D.
Policy Analysis Staff
FTS 8-382-2201

Office of Waste Programs Enforcement

Sheryl Sterling
Chief, Health Sciences Section
FTS 8-382-5646

Office of Pesticide and Toxic Substances

Arnold Edelman
Chemical Activity Coordination Group
FTS 8-382-2249

Terry O'Bryan
OTS Chemical Assessment Desk
FTS 8-382-3483

[NOTE: The OTS Chemical Assessment Desk is an outreach service to other **EPA** offices and regions to provide consultation and share information on *risk assessment* activity for chemicals evaluated in the OTS Existing Chemicals Program. The Desk also provides estimates of chemical toxicity and environmental fate based on structure activity relationships in the absence of data, and offers assistance in identifying related *risk assessment* activities in other **EPA** program offices.]

Office of Research and Development

Contact for cancer/mutagenicity/reproductive effects *risk assessment* questions.

Peter W. Preuss, Ph.D.
Director, Office of Health and Environmental Assessment
FTS 8-382-7315

William Farland, Ph.D.
Office of Health and Environmental Assessment
FTS 8-382-5898

Contact for exposure assessment questions.

Michael A. Callahan, Ph.D.
Office of Health and Environmental Assessment
FTS 8-475-8909

Contact for *risk assessment* methods for non-carcinogens and chemical mixtures.

Lester Grant, Ph.D.
Environmental Criteria and Assessment Office
FTS 8-629-4173

[NOTE: Lester Grant is located in Region IV, Hwy 54 and Alex Road, Research Triangle Park, NC, 27711.]

Chris DeRosa
Environmental Criteria and Assessment Office
FTS 8-684-7534
Commercial (513) 569-7534

[NOTE: Chris DeRosa is located in Region V, 26 West St. Clair Street, Cincinnati, OH 45268.]

Office of Information Resources Management: Risk Assessment/Risk Management Bulletin Board

The Office of Information Resources Management has established a *risk assessment* and risk management "Bulletin Board" on **EPA's** electronic mail (E-mail) system. Anyone in **EPA** with access to E-mail can post messages on the bulletin board and read messages posted by others. The Bulletin Board can be used to: post notices of upcoming conferences, workshops, and other events; request assistance from others on specific *risk assessment* or risk management problems; inform others of useful information; and, in general, promote further communication regarding risk related matters. For assistance in posting announcements or reading entries on the Bulletin Board, contact Electronic Mail User's Support at FTS 8-382-5639 or Earl Bozeman, Region IV, FTS 8-257-3776

Office of Radiation Programs

Jerome S. Puskin,
Chief, Bioeffects Analysis Branch
FTS 8-475-9640

APPENDIX A

INFORMATION RESOURCE MATRICES: RESOURCES VS. DATA CATEGORIES AND SUBCATEGORIES

This appendix presents three sets of matrices which match data categories and subcategories (described below) against major information resources. The purpose of the matrices is to document the types of information (i.e., data categories or data subcategories) available in the major information resources. While non-bibliographic computerized information resources are matched against data subcategories, both bibliographic data bases and manual resources are indexed by data categories only. It would have been technically infeasible to match bibliographic data bases and manual resources against data subcategories.

The **First Set of Matrices** matches data subcategories against computerized non-bibliographic data bases. This set of matrices establishes the relationships between information resources and data by indicating the specific types of data, i.e., data subcategories that are available in these information resources. In using these matrices, users may want to consult simultaneously the resource attributes matrices in Appendix B in order to obtain a complete understanding about the availabilities as well as the searchabilities of data bases.

The **Second Set of Matrices** matches data categories against computerized bibliographic data bases. This establishes the availabilities of major types of data, i.e., data categories, in the bibliographic data bases. Again users are urged to consult the resource attributes matrices on bibliographic data bases in **Appendix B** for a complete characterization of the source.

The **Third Set of Matrices** in this section matches data categories against manual information resources. A matrix outline is included in this section. For each of these manual sources listed in the matrices, its major search attributes are included and indexed. Wherever a manual source is available at **EPA**, it is so indicated in the matrices.

When scanning a matrix, the user may wish to use the Data Category and Subcategory definitions included in Section A.1 in order to decode the information presented. (For this draft of the **Directory**, the matrices do not include all information resources, but only 20-25 of the more useful data bases.)

A.1 DEVELOPMENT OF DATA CATEGORIES AND SUBCATEGORIES*

This section classifies user information requirements into the following four major data Hazard Identification categories:

- Dose-Response Assessment
- Exposure Assessment
- Hazard Identification
- Risk Characterization

Within each of the four major data categories, subcategories are identified. A subcategory is not necessarily a data element; it may, in some cases, represent a group of data elements.

The classification of data categories and subcategories is a complex and difficult task. There is probably no one single "correct" way of categorizing the types of technical data that are needed. Therefore, some of the data categories were developed partially based on specific information requirements for certain types of analyses as defined in Chapter 2. However, certain data categories, e.g., Physical/Chemical Properties, may reflect the traditional grouping of data elements from an information management standpoint, and do not necessarily align themselves with specific types of analyses. Physical/chemical properties data, for example, are used in support of Hazard Identification and Exposure Assessment.

In determining how certain subcategories should be listed under a specific data category, two factors were taken into consideration. First, a subcategory is placed under a data category which, from a hierarchical standpoint, is the most logical parent of that subcategory. Second, if a subcategory can be logically placed under more than one major category, that subcategory is then listed under the more appropriate category.

To facilitate use and understanding of the data categories and their subcategories, several data organization techniques are used. First, a scope note is included for each major data category, describing the scope or special features of that category (a scope note is, nevertheless, not a definition and, therefore, does not define a category). Second, a definition (in some cases, a scope note) is developed for each subcategory (see Glossary). Third, where a subcategory may be logically placed under more than a single major category, the more appropriate category is chosen to incorporate that subcategory and its definition. The same term is repeated under the less appropriate category without a definition, and a "See" reference is used referring the reader to the more appropriate category.

In using this section of the **Directory**, the following must be taken into consideration:

1. For each data category, only those subcategories that are needed for risk characterization are included. Therefore, a category may not include all of the possible subcategories.

2. Some of the subcategories represent the types of information that are not readily available in either the open literature or existing information resources.

3. The definitions for the subcategories are not necessarily the types of definitions that can be found in a text book or a dictionary. Many of the definitions are scope notes describing what is covered under a subcategory.

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*The data categories and subcategories described in this section were developed from those given in the *OTS Information Architecture Notebook*, dated 1983.

A.1.1 Hazard Identification

Data subcategories that are listed below are those that are needed to identify the hazard associated with a specific chemical.

Subcategories

- 1. Substance Identification
- 2. Physical/Chemical Properties
- 3. Hazard Characterization
- 4. Comparisons of Molecular Structures

1. **Substance Identification.** This involves the identification of a substance based upon its commonly used names and synonyms, chemical formula and composition, and Chemical Abstracts Service (CAS) registry numbers.

2. **Physical/Chemical Properties.** These properties indicate the potential for a chemical substance to migrate through environmental media as well as the health effects that the chemical will have. Some physical/chemical properties relevant to hazard identification include: solubility, adsorption coefficient, hydrolysis rate, physical state, partition coefficient, molecular weight, etc.

3. **Hazard Characterization.** This involves an assessment of various hazards and health effects associated with a specific chemical. The hazard characterization can be done by using data from epidemiologic, animal bioassay, and short-term studies done for the chemical in question.

4. **Comparisons of Molecular Structures.** Because properties and toxicities may sometimes be similar for different but related chemicals, it may be necessary to compare chemical molecular structures. Molecular structure information often makes it easier to make exact distinctions between two chemicals with similar formulas.

A.1.2 Dose-Response Assessment (Toxicokinetic and Bioeffects)

Study results on dose-response reactions of specific chemicals often contain raw pharmacological data which must be extrapolated in order to be applied to Risk Assessments. Data subcategories listed below are the types of operations that must be applied to pharmacological data in order to extrapolate the results to risk characterization.

Subcategories

- 1. Low-Dose Extrapolation
- 2. Animal-to-Human Dose Extrapolation
- 3. Route Extrapolation
- 4. Duration Extrapolation

1. **Low-Dose Extrapolation.** Studies on health effects involving either humans or laboratory animals exposed to doses higher than anticipated in the environment. Mathematical extrapolation is necessary to estimate the response at lower environmental doses.

2. **Animal-to-Human Dose Extrapolation.** Studies on health effects are also often done with laboratory animals. Extrapolation of animal-dose responses is necessary to use the study results to predict human dose responses.

3. **Route Extrapolation.** Studies are occasionally unavailable for the exposure route of interest, so dose-response relationships must be inferred or extrapolated from data on another exposure route. This extrapolation is usually used for estimating route or media specific criteria levels and standards.

4. **Duration Extrapolation.** Dose-response studies covering relatively short periods are frequently inadequate for evaluating chronic exposures. Therefore, longer term dose-response or dose severity relationships must be inferred from subchronic and shorter term studies.

A.1.3 Exposure Assessment

What the concentration will be at an exposure point and information on the population susceptible to exposure can be determined by factors listed in the subcategories below. The exposure to a contaminant can be through air, soil, or water.

Subcategories

- 1. Physical/Chemical Properties
- 2. Environmental Fate and Transport Characteristics
- 3. Chemical Concentrations in Environmental Media
- 4. Population at Risk
- 5. Exposure Route, Magnitude & Duration

1. **Physical/Chemical Properties.** See Section A.1.1.

2. **Environmental Fate and Transport Characteristics.** These refer to characteristics which determine environmental fate and transport of both the chemical in question and of the environmental media through which transport is occurring. Relevant chemical characteristics include such parameters as partition coefficient and solubility, while relevant environmental media characteristics include such things as soil type and wind direction.

3. **Chemical Concentrations in Environmental Media.** These can be determined through the use of fate and transport models and monitoring data. Once they are determined, estimations of concentrations at specific exposure points can be made to further characterize the risk.

4. **Population at Risk.** In order to fully characterize a risk, it is necessary to quantify the population susceptible to exposure. This can be approached using information from a variety of sources, including zoning maps or lists of ground or surface water users near a specific site.

5. **Exposure, Route, Magnitude, & Duration.** These determine what population will be exposed and to what magnitude the exposure will be. They are determined by factors mentioned above along with data on environmental persistence and bioaccumulation rates of specific chemicals.

A.1.4 Risk Characterization

Once the concentration of a chemical substance at an exposure point is estimated, it is then possible to determine health effects which may result. The following subcategories are various effects that a contaminant may have on health.

Subcategories/Definitions

- 1. Environmental Effects
- 2. Human Risk-Assessment

1. **Environmental Effects.** Environmental effects from exposure to chemical substances include both aquatic and terrestrial effects. Aquatic effects are those which occur on aquatic vertebrates and invertebrates as well as vascular and non vascular aquatic plants. Terrestrial effects are those which occur on terrestrial vertebrates and invertebrates as well as vascular and non-vascular terrestrial plants.

2. **Human Risk-Assessment.** This involves a quantification of both carcinogenic and non-carcinogenic risks. Human Risk Assessment is following the exposure assessment which indicates exposure amounts, susceptible populations, and durations of exposure.

EXHIBIT A-1 INFORMATION MATRIX
NON-BIBLIOGRAPHIC DATA BASES VS. DATA SUBCATEGORIES

CECATS	GTDMIS	OHM-TADS	SPHERE - AQUIRE	SPHERE-DADB	SPHERE-ENVIROFATE	SPHERE-GENETOX	SPHERE-ISHOW			
X		X					X	Substance Identification		Hazard Identification
		X			X		X	Physical/Chemical Properties		
X	X	X		X				Epidemiologic Data	Hazard Characterization	
X	X	X	X	X				Animal-Bioassay Data		
X	X	X	X	X				Short-Term Studies		
								Comparison of Molecular Structures		
				X				Low-Dose Extrapolation		Dose Response Assessment
				X				Animal-to-Human Dose Extrapolation		
		X			X		X	Physical/Chemical Properties		Exposure Assessment
					X			Environmental Fate and Transport Characteristics		
								Chemical Concentrations in Environmental Media		
								Population at Risk		
		X						Exposure Rate, Magnitude & Duration		
		X		X				Carcinogens	Human Risk Assessment	Risk Characterization
		X		X		X		Non-Carcinogens		
			X			X		Environmental Effects		

EXHIBIT A-2 INFORMATION MATRIX
NON-BIBLIOGRAPHIC DATA BASES VS. DATA SUBCATEGORIES

Non-EPA ENVIRONMENTAL FATE DATA BASE

CHEMFATE	HAZARDLINE	RTECS	TOXICOLOGY DATA BANK	TOXLINE			
X	X	X	X		Substance Identification		Hazard Identification
X	X	X	X		Physical/Chemical Properties		
		X		X	Epidemiologic Data	Hazard Characterization	
		X		X	Animal-Bioassay Data		
		X		X	Short-Term Studies		
		X	X		Comparison of Molecular Structures		
				X	Low-Dose Extrapolation		Dose Response Assessment
				X	Animal-to-Human Dose Extrapolation		
X	X				Physical/Chemical Properties		Exposure Assessment
X			X		Environmental Fate and Transport Characteristics		
X			X		Chemical Concentrations in Environmental Media		
					Population at Risk		
					Exposure Rate, Magnitude & Duration		
	X	X	X	X	Carcinogens	Human Risk Assessment	Risk Characterization
	X	X	X	X	Non-Carcinogens		
			X		Environmental Effects		

EXHIBIT A-3 INFORMATION MATRIX
BIBLIOGRAPHIC DATA BASES VS. DATA CATEGORIES

TITLE OF SOURCE	HAZARD IDENTIFICATION	DOSE-RESPONSE ASSESSMENT	EXPOSURE ASSESSMENT	RISK CHARACTERIZATION
EPA				
CRIB	X		X	X
EPA CASR	X	X	X	X
SPHERE	X	X		X
NON-EPA				
ENVIRONMENTAL FATE DATA BASE				
- DATALOG	X		X	
- BIOLOG		X		X
ENVIROLINE	X	X	X	X
NIOSHTIC				
TOXLINE				
- HEEP	X	X		X
- CBAC	X	X		X
- HAYES FILE ON PESTICIDES	X	X		X
- HMTC	X			
- PESTICIDES ABSTRACTS	X			
- TMIC	X	X		X
- TOXICITY BIBLIOGRAPHY	X	X		X
- RPROJ	X	X		X
- TD3				

EXHIBIT A-4 INFORMATION MATRIX
MANUAL SOURCES VS. DATA CATEGORIES

TITLE OF SOURCE	HAZARD IDENTIFICATION	DOSE-RESPONSE ASSESSMENT	EXPOSURE ASSESSMENT	RISK CHARACTERIZATION
MANUALS				
ENDANGERMENT ASSESSMENT HANDBOOK	X	X	X	X
GEMS USER'S GUIDE			X	
GUIDANCE TO FEASIBILITY STUDIES UNDER CERCLA		X	X	X
GUIDANCE ON REMEDIAL INVESTIGATIONS UNDER CERCLA	X		X	
SUMMARY CHEMICAL INFORMATION PROFILE USERS MANUAL	X			X
SUPERFUND EXPOSURE ASSESSMENT MANUAL	X	X	X	X
SUPERFUND PUBLIC HEALTH EVALUATION MANUAL	X	X	X	X
TOXICOLOGY HANDBOOK, PRINCIPALS RELATED TO HAZARDUOS WASTE SITE INVESTIGATIONS	X	X		X
USERS GUIDE TO CASR	X		X	
DIRECTORIES				
CHEMICAL ACTIVITIES STATUS REPORT	X			
EXTRAMURAL ACTIVITY REPORT	X			
DIRECTORY OF ONLINE DATA BASES	X	X	X	X
FEDERAL DATA BASE FINDER	X	X	X	X
GROUND WATER MANAGEMENT: THE USE OF NUMERICAL MODELS			X	X
INDUSTRY PROGRAM INTERACTION MATRIX: A GUIDE TO SELECTED PERSONNEL WHO ARE FAMILIAR WITH SELECTED INDUSTRIES	X			
INFORMATION RESOURCES IN TOXICOLOGY	X	X		X
MANAGER'S GUIDE TO EPA ACTIVITIES ON TOXIC AND HAZARDOUS CHEMICALS	X			X
NIOSH PUBLICATION CATALOG	X	X		X
NTIS DIRECTORY OF COMPUTERIZED DATA FILES	X	X		X
OTS INFORMATION ARCHITECTURE NOTEBOOK	X	X	X	X
THE STATUS OF CHEMICALS IN THE SPECIAL REVIEW PROGRAM, REGISTRATION PROGRAM, AND DATA CALL-IN PROGRAM	X	X		X

APPENDIX B

INFORMATION RESOURCES MATRICES
RESOURCES VS ATTRIBUTES

This appendix presents the resource attributes of the major computerized data bases that can be used in support of the types of analyses required in performing *risk-assessments*. Non-computerized resources are included in Chapters 6 & 7 of the **Directory** since they have few significantly different attributes.

There are two types of resource attributes that are used to describe a computerized information resource, i.e., search attributes and system attributes. While search attributes pertain mainly to the searchability and retrieval features of the data, system attributes describe characteristics of the system, including hardware and software used and access mode. The search and system attributes of online data bases define for the user what features, information, and capabilities are available. The intent of this appendix of the **Directory** is to make the user aware of the variety of information resources available, to help the user decide which attributes can facilitate access, and to assist the user in selecting the most appropriate resource(s) to solve the information problems.

This appendix contains three parts. The first part is the matrix outline, listing resource attributes in a hierarchical format and includes definitions (or sometimes scope notes) and codings for the attributes. Following the definitions are two matrices matching search and system attributes against computerized information resources. In these matrices, the attributes are listed on the horizontal axis in the same sequence as they appear in the hierarchical listing. The computerized information resources are placed on the vertical axis of the matrix and are divided into two main groups, i.e., bibliographic data bases and non-bibliographic data bases. Within each of these two groups, the systems are listed in alphabetical sequence and are divided into **EPA** and **Non-EPA** data bases. In the matrix, the information resources are either indexed by an "X" symbol or by some other alphanumeric notation. For explanations on the notations used in the matrix, consult the attributes definitions in this Appendix. (For this version of the **Directory**, the matrices do not include all information resources, but only 20-25 of the more useful data bases.)

B.1 INFORMATION RESOURCES/ATTRIBUTES MATRIX OUTLINE

Definitions for the column headings in the data base search and system attribute matrix are provided below in the order in which they appear in the matrix. A key is also provided for the various symbols entered in the matrix.

B.1.1 Search Attributes

- 1. Chemical Searching
- 2. Subject Searching
- 3. Alphanumeric Searching
- 4. Bibliographic Information Searching
- 5. Logical Searching
- 6. Search Aids

1. **Chemical Searching.** This column indicates whether or not there are chemical-specific search and retrieval capabilities and, if so, what chemical search options are available. Chemicals can be searched by:

S - substructure

CR - chemical reference number

NM - name match

2. **Subject Searching.** An "X" in this column indicates that specific concepts, topics, and/or descriptions can be searched and retrieved.

3. **Alpha/Numeric Searching.** An "X" in this column indicates that specific numeric or alpha numeric data are available and can be searched and retrieved.

4. **Bibliographic Information.** An "X" in this column means that bibliographic information (referring to the document from which data were extracted) can be either used as the object of a search and/or displayed in retrieved records. This type of information may include such things as author, title, year of publication, journal title (if applicable), language type, and abstract.

5. **Logical Searching.** This column indicates whether or not there may be manipulation of search terms to provide more specific or comprehensive searches. Logical searching may be:

FS - field specific; capability to search selected specific fields (indirect search or serial search)

BWF - Boolean logic within fields; using logical operations ("and," "or," and "not") to show relationships between sets of terms involving the same field of data

BAF - Boolean logic across fields; logical operators can be used to link separate fields.

6. **Search Aids.** This column shows whether or not there is tutorial help available on searching the data base or on describing the file contents.

B.1.2 System Attributes

1. File Size and Use
    - -Number of Records
    - -Number of Chemicals

2. Data Base Characteristics
    - -Update Cycle
    - -Cost
    - -Coverage Period

3. System Access
    - -Source
    - -Status
    - -Interactive
    - -Restricted Access

4. Hardware
    - -Computer Utilized
    - -Computer Owner

5. Software
    - -Program Language
    - -Command Language

6. System User Aids

1. **File Size and Use.** This denotes the number of records available in the data base, where a record is a unit of related information (e.g., a record is generally meant to include all the information stored for a particular document in a bibliographic data base). It also denotes the number of unique chemicals, substances, formulations, generic classes, etc., in a data base.

2. **Data Base Characteristics**

Update Cycle - Shows the frequency of additions to the records in the data base. The key to the letters in this column is as follows:

C - closed
D - daily
W - weekly
BW - biweekly
M - monthly
BM - bimonthly
Q - quarterly
SA - semi-annually
A - annually
I - irregular

Cost - Itemizes the cost (dollars) per connect hour. This does not include subscription fees, print costs, or telecommunication fees.

Coverage Period - Shows the span of coverage represented by the data base contents. No date on the most recent end of a range (e.g., 1971-) indicates that coverage is to the present.

Content Type - This column denotes specific characteristics of the data base's information according to:

U - unpublished data; data is not in the public domain (e.g., communications, private files, etc.)
O - ongoing research; contains references to research which is in progress
I - international sources; data taken from non-U.S. sources either entirely or in addition to U.S.sources.

3. **System Access**

Source - Shows the availability of the data base to the end user, where:
C = commercial
P = private

Status - Denotes the current availability of a data base, where:
D = developed
U = under development

Interactive. If this column is marked with an "X", the system allows the user to input instructions, receive a response, and then modify or manipulate the results.

Restricted Access. An "X" in this column indicates that the data base is available to a limited user community (e.g., contains confidential data, is available only for "in-house" use, etc.)

4. **Hardware**

Computer Utilized - This column denoted the specific hardware in which the data base resides, where:
VAX = VAX 11/780
IBM = IBM
UNI = Univac

Computer Owner - This column shows the organization which owns or leases the hardware, where:
EPA = EPA
C = contractor
D = developer of data base

5. **Software**

Program Language - This column shows the defined set of characteristics and rules used for writing the computer routine (e.g., COBOL, PL/1, BASIC).

Command Language - Provides direct interface with the central processing unit and determines data entry and editing facilities, submission and retrieval capabilities, and utility and data set manipulation functions (e.g., TSO, ELHILL).

6. **System User Aids** - An "X" in this column indicates that there is documentation available for the user to facilitate interaction with the system.

EXHIBIT B-1 INFORMATION MATRIX
EPA DATABASE SYSTEMS ATTRIBUTES

SPHERE-ISHOW	SHPERE-GENETOX	SPHERE-DERMAL ABSORPTION	SPHERE-CHEMFATE	SPHERE-AQUIRE	OHM-TADS	CASR	CECATS	EPA DATA BASES	
14K		3539	6.2K	30K	1.3K	4K	5K	Number of Records	File Size and Use
14K	2800	655	418	1.8K		4K	15K	Number of Chemicals	
		C		C	C	I	D	Update Cycle	Data Base Characteristics
								Cost	
		1970-81	1968-	1970-81	1950-76	1970-	1976-	Coverage Period	
O	O		O	O	U,O	U,O	U,O		Content Type
C	P	P	C	P	C	C	C	Source	System Access
U	U	U	D	U	D	D	D	Status	
X	X	X	X	X	X	X	X	Interactive	
X	X	X		X				Restrictive Access	
								Computer Utilized	Hardware
C	C	C	C	C	C	EPA	EPA	Computer Owner	
								Program Language	Software
								Command Language	
X	X	X	X	X	X	X	X		System User Aids

EXHIBIT B-2 INFORMATION MATRIX
NON-EPA DATABASE SYSTEMS ATTRIBUTES

Non-EPA DATA BASES							
TOXLINE	RTECS	NIOSHTIC	HAZARDLINE	ENVIROLINE	CESARS		
1400K		102K	1.3K	116K	21K	Number of Records	File Size and Use
	73K		1.3K		3K	Number of Chemicals	
M	M	BW	D	M	S	Update Cycle	Data Base Characteristics
55	22		120	90	85	Cost	
1965-	1890-	1880-		1971-	1976-	Coverage Period	
O,I	U,O,I	U,O,I	U,O	U,O,I	U,O		Content Type
C	C	C	C	C	C	Source	System Access
D	D	D	D	D	D	Status	
X	X		X	X	X	Interactive	
						Restrictive Access	
						Computer Utilized	Hardware
D		D		D	D	Computer Owner	
						Program Language	Software
						Command Language	
X	X	X		X	X		System User Aids

EXHIBIT B-3 INFORMATION MATRIX
DATA BASE SEARCH ATTRIBUTES

DATA BASE	CHEMICAL SEARCHING	LOGICAL SEARCHING	SUBJECT SEARCHING	ALPHA/NUMERIC SEARCHING	BIBLIOGRAPHIC INFORMATION SEARCHING	SEARCH AIDS
EPA DATA BASES						
CECATS	CR	FS				X
EPA CASR	CR	FS,BAF				X
OHM-TADS	CR,NM	FS,BWF,BAF	X	X		
SPHERE DATA BASES						
-AQUIRE	CR,NM	FS,BWF,BAF	X	X	X	X
-CHEMFATE	CR	FS,BWF			X	
-DERMAL ABSORPTION	CR,NM	FS,BWF,BAF	X	X	X	X
-GENETOX	S,CR,NM	FS,BWF,BAF	X		X	
-ISHOW	CR,NM	FS,BWF,BAF	X	X	X	X
NON-EPA DATA BASES						
CESARS	CR,NM			X		X
ENVIROLINE	NM	FS,BWF,BAF	X		X	X
HAZARDLINE	CR,NM	FS	X		X	X
NIOSHTIC	CR,NM	FS,BWF,BAF	X		X	
RTECS	S,CR,NM	FS,BWF,BAF	X	X		X
TOXLINE	CR,NM	FS,BWF,BAF	X		X	

APPENDIX C

INFORMATION RESOURCES AND THE SUPERFUND PUBLIC HEALTH EVALUATION MANUAL

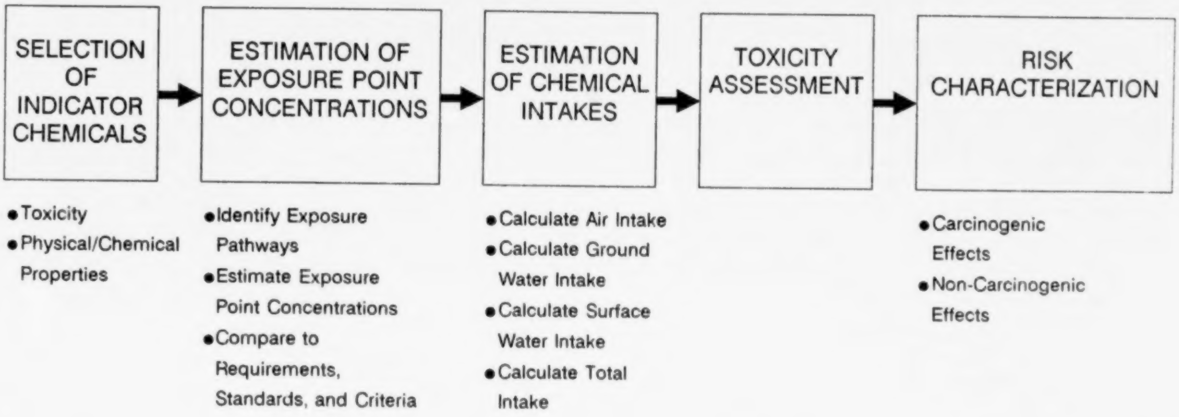
This appendix is intended to serve as a reference for information sources when the *Superfund Public Health Evaluation Manual* and the *Superfund Exposure Assessment Manual* do not contain the specific information required to evaluate the potential risks posed by a chemical identified at a Superfund site. To simplify the task of finding data, the information sources in this appendix of the **Directory** are listed under subheadings that reflect the five steps of the public health evaluation process as described in Chapters 3 through 7 of the *Superfund Public Health Evaluation Manual*. Specifically, the information categories are related to the following functions:

- Selection of Indicator Chemicals
- Estimation of Exposure Point Concentrations of Indicator
- Chemicals
- Estimation of Chemical Intakes
- Toxicity Assessment
- Risk Characterization

This appendix of the **Directory** summarizes available data bases and data files and tapes to aid users of the Manual in finding specific sources of information as needed. Other types of information resources, such as models, manuals, directories, periodicals, general publications, and people, may also be useful in providing needed information for the public health evaluation process. For example, *Health Effects Assessment Documents* (see Section 7.2 of this **Directory**) provide useful exposure level data. Therefore, the user of this appendix should, in addition to reviewing the data bases and data files and tapes identified here, review Chapters 5, 6, 7, and 8 of the **Directory** to identify other important information resources.

Exhibit C-1 outlines the steps of the public health evaluation process and identifies potential information requirements associated with each step in the process. For each of the subheadings of information requirements, there is a descriptive statement about the purpose and type of information needed, followed by a listing of the major relevant data bases and data files and tapes. Chapters 3 and 4 of the **Directory** can then be used to characterize more fully and gain access to particular information resources.

C-1 STEPS INVOLVED IN THE SUPERFUND PUBLIC HEALTH EVALUATION PROCESS


SELECTION OF INDICATOR CHEMICALS
ESTIMATION OF EXPOSURE POINT CONCENTRATIONS
ESTIMATION OF CHEMICAL INTAKES
TOXICITY ASSESSMENT
RISK CHARACTERIZATION
•Toxicity
•Physical/Chemical Properties
•Identify Exposure Pathways
•Estimate Exposure Point Concentrations
•Compare to Requirements, Standards, and Criteria
•Calculate Air Intake
•Calculate Ground Water Intake
•Calculate Surface Water Intake
•Calculate Total Intake
•Carcinogenic Effects
•Non-Carcinogenic Effects

C.1 SELECTION OF INDICATOR CHEMICALS

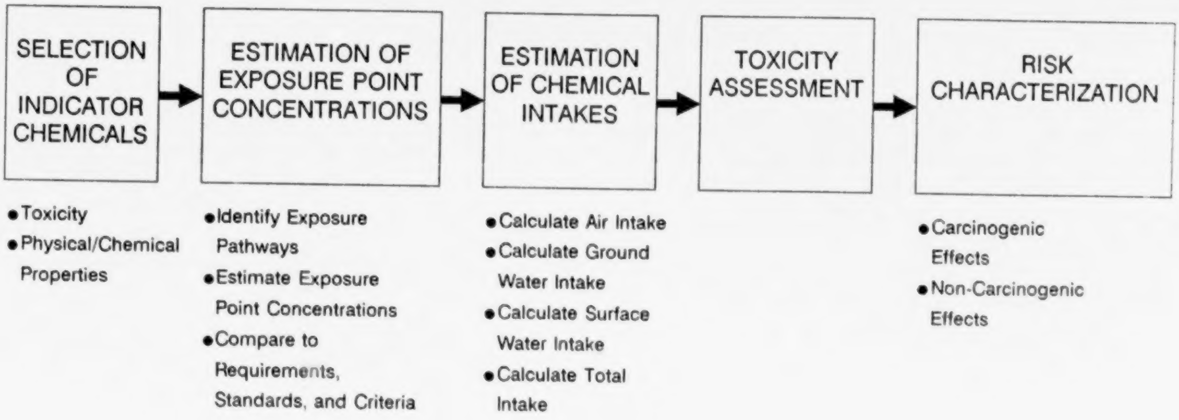
The *Superfund Public Health Evaluation Manual* recommends that if there are fewer than 10 to 15 chemicals actually identified at a hazardous waste site all of them should be evaluated for their potential public health risk at the site. For those circumstances when there are many chemicals at a site, the *Manual* includes two information sources, Appendices C and D, which contain information that allows the "highest risk" chemicals to be identified. Appendix C contains data on the toxicity, mobility, and persistence of specific chemicals, whereas Appendix D presents more detailed methods for deriving indicator scores for chemicals not listed in Appendix C. The selection of indicator chemicals is based on contaminant toxicities and physical/chemical properties, and useful sources for these two types of data are presented separately below.

C.1.1 Evaluate Chemical Toxicity

Toxicity data include information on the response of an organism to a dose of a chemical substance through various routes of exposure. Such data may be for chronic toxicity or acute/subacute toxicity and may represent acute, subchronic or chronic exposure durations. The following are data bases, files, and tapes that are useful sources of toxicity data.

EPA Data Bases (see Section 3.1 for details)
- ACUTE HAZARDS DATA
- AIR TOXICS CLEARINGHOUSE
- CECATS
- CRIB
- EEFIS
- CSDCLEANS
- DEEP
- EPACASR
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GI

C-1 STEPS INVOLVED IN THE SUPERFUND PUBLIC HEALTH EVALUATION PROCESS


SELECTION OF INDICATOR CHEMICALS
ESTIMATION OF EXPOSURE POINT CONCENTRATIONS
ESTIMATION OF CHEMICAL INTAKES
TOXICITY ASSESSMENT
RISK CHARACTERIZATION
•Toxicity
•Physical/Chemical Properties
•Identify Exposure Pathways
•Estimate Exposure Point Concentrations
•Compare to Requirements, Standards, and Criteria
•Calculate Air Intake
•Calculate Ground Water Intake
•Calculate Surface Water Intake
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- CECATS
- CRIB
- EEFIS
- CSDCLEANS
- DEEP
- EPACASR
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GI

- GTDMIS
- HEOX
- IRIS
- NEUROTOXICITY DATA
- OHM-TADS
- ORALTOX
- PDAS
- PDMS
- PHRED
- RAD
- SPHERE
- STARA
- WBC

Non-EPA Data Bases (see Section 3.2 for details)

- ACS JOURNALS ONLINE
- AGRICOLA
- AQUALINE
- ASFA
- BIOSIS
- CBDS
- CCRIS
- CESARS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CHEMLINE
- CLEARINGHOUSE ON
- HEALTH INDEXES
- CTCP
- EMBASE
- ENVIROLINE
- ENVIRONMENTAL FATE DATA BASES
- HSDB
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NTIS
- NPIRS
- OHS-MSDS
- PASCAL
- PROFILE
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

EPA Data Files and Tapes (see Section 4.1 for details)

- ETHOX
- FILES OF EXPOSURE ASSESSMENTS FOR EXISTING CHEMICALS
- GASTRO-INTESTINAL EFFECTS LITERATURE
- ITC CHEMICAL SCORES
- TSCA NEW CHEMICALS
- TSCA SECTION 4 CHEMICAL BIBLIOGRAPHIES

C.1.2 Physical/Chemical Properties

The data bases listed under this heading are useful sources of information for physical/chemical properties, which may be needed to select indicator chemicals.

EPA Data Bases (see Section 3.1 for details)
- CHEMD
- GEMS
- OHM-TADS
- PDMS
- PHRED
- SPHERE
- TSDF

Non-EPA Data Bases (see Section 3.2 for details)
- CA SEARCH
- CASSI
- CESARS
- CHEMLINE
- CHEMTRAN
- CIS
- DARC
- DORTMUND VLE DATA BANK
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- HEILBRON
- LOG P DATABASE
- NPIRS
- OHS-MSDS
- PASCAL
- RNSS

EPA Data Files and Tapes (see Section 4.1)
- WATER SOLUBILITY DATA

C.2 ESTIMATION OF EXPOSURE POINT CONCENTRATIONS

This step in the process described in the *Superfund Public Health Evaluation Manual* involves estimating baseline environmental concentrations of indicator chemicals so that the extent and duration of human exposure can be determined. Often at Superfund sites, contamination may not yet have reached a point of human exposure. In those cases, it is therefore necessary to estimate where and to what extent exposure will take place. This can be done through the use of chemical fate and transport models (see Chapter 5 of this **Directory**).

The steps involved in estimating exposure point concentrations in various types of environmental media include:

- Identifying Exposure Pathways
- Estimating Exposure Point Concentrations
- Comparing to Requirements, Standards, and Criteria

Various types of data, including chemical and environmental media properties, are needed to use fate and transport models to estimate exposure point concentrations. Once the estimates are made, it is necessary to compare them to exposure limits for the chemicals.

C.2.1 Identify Exposure Pathways

The pathway that a chemical will take towards an exposure point depends on the characteristics of the site and of the transport media, be it air, surface, or ground water. These characteristics include such things as ground water flow direction or wind direction. The following informational resources are useful in identifying exposure pathways. Because this step is highly site-specific, however, relatively few resources are listed.

EPA Data Bases (see Section 3.1)
- GEMS
- STORET

Non-EPA Data Bases (see Section 3.2)
- DMS
- MWDI
- NERDES
- WDSD
- WATERNET
- WATER RESOURCES ABSTRACTS
- WATSTORE
- WRSIC

EPA Data Files and Tapes (see Section 4.1)
- SAROAD

Non-EPA Data Files and Tapes (see Section 4.2)
- ADR
- AOWF
- BASIC WELL DATA FOR PROFESSIONAL PAPER 796
- GEOECOLOGY DATA BASE
- INDEX TO GEOLOGIC MAPS
- STAR
- SUMMARY OF THE MONTHLY CO-OP ELEMENT
- SURFACE AIRWAYS OBSERVATIONS

C.2.2 Estimate Exposure Point Concentrations

Where monitoring data do not exist or where contaminants have not yet reached exposure points, mathematical models can be used to predict concentrations. Fate and transport models listed in Chapter 5 of this **Directory** can aid in this step.

In addition, there are several available data bases and data files and tapes which contain information on chemical concentrations in environmental media:

EPA Data Bases (see Section 3.1)
- AIRTOXICS CLEARINGHOUSE
- EERF
- ERFD
- GEMS

- MICROBIOLOGICAL DATA
- PDMS
- STORET
- TSDF

Non-EPA Data Bases (see Section 3.2)

- DMS
- MWDI
- NEDRES
- NGWIC
- NPIRS
- SIRS
- WDSD
- WATER RESOURCES ABSTRACTS
- WATERLINE
- WATSTORE

EPA Data Files and Tapes (see Section 4.1)

- CHAMP
- CHEMICALS IDENTIFIED IN HUMAN BIOLOGICAL MEDIA
- EPID
- SAROAD

Non-EPA Data Files and Tapes (see Section 4.2)

- ADR
- AOWF
- BASIC WELL DATA FOR PROFESSIONAL PAPER 796
- GEOECOLOGY DATA BASE
- INDEX TO GEOLOGIC MAPS
- NASQAN
- MIXING HEIGHT STUDIES
- STABILITY ARRAY
- SUMMARY OF THE MONTHLY CO-OP ELEMENT FILE
- SURFACE AIRWAYS OBSERVATIONS
- U.S. SOIL TEMPERATURES
- VOLATILE ORGANIC CHEMICALS IN THE ATMOSPHERE: AN ASSESSMENT OF AVAILABLE DATA

C.2.3 Compare to Requirements, Standards and Criteria

Once estimates of exposure point concentrations are made, it is necessary to compare these estimates to existing health standards and limits for the indicator chemicals. The following resources are useful in finding these data.

EPA Data Bases (see Section 3.1)

- EPACASR
- IRIS
- PHRED

Non-EPA Data Files (see Section 3.2)

- CHEMICAL REGULATION REPORTER
- CHEMLAW
- CHEMLINE
- CRGS
- CTCP

- ENVIRONMENTAL HEALTH NEWS
- HAZARDLINE
- HSDB
- NIOSHTIC
- OCIS
- OHS-MSDS
- RTEGS
- WATERLINE
- WATERNET

C.3 ESTIMATION OF CHEMICAL INTAKES

In order to assess the potential adverse health effects associated with a site, it is necessary to determine the amount of human exposure to the indicator chemicals. Human exposure is expressed in terms of intake, which is the amount of substance taken into the body per unit body weight per length of time. The intakes are calculated separately for various environmental media. The steps involved in estimating overall intake are:

- Calculate Air Intake
- Calculate Ground Water Intake
- Calculate Surface Water Intake
- Combine Pathway-Specific Intakes to Yield Total Intake

Intake should be calculated both as subchronic daily intake (SDI) and as chronic daily intake (CDI). This can be calculated from data on exposure concentrations, and vital statistics on the exposed population.

C.3.1 Calculate Air Intake

Human intake of contaminants in air is dependent upon the contaminant concentration, the frequency and volume of inhalations, the duration of exposure, and particulate size. The following information resources are useful in calculating air intakes.

EPA Data Bases (see Section 3.1)
- AIR TOXICS CLEARINGHOUSE
- CRIB
- ERFD
- EERF
- GEMS
- INHALATION LITERATURE
- TSDF
- WBC

Non-EPA Data Bases (see Section 3.2)
- NOHS

EPA Data Files and Tapes (see Section 4.1)
- CHAMP

Non-EPA Data Files and Tapes (see Section 4.2)
- VOLATILE ORGANIC CHEMICALS IN THE ATMOSPHERE

C.3.2 Calculate Ground-Water Intake

Human exposure to contaminated ground water can occur from wells used as a drinking water source. The degree of exposure depends on the concentration of the contaminant in drinking water, the amount consumed per day, and the duration of exposure. The following information resources are useful in calculating ground water intakes.

EPA Data Bases (see Section 3.1)
- GEMS

Non-EPA Data Bases (see Section 3.2)
- MWDI
- WATERLINE
- WATERNET
- WATSTORE

C.3.3 Calculate Surface Water Intake

Intake of contaminants from surface water can occur from both ingestion of surface water or from ingestion of contaminated fish. Intake from surface water occurs when the surface water is used as a drinking water source. As with ground water, the intake depends on the amount ingested per day and the duration of exposure. Intake from contaminated fish depends upon the contaminant concentrations in the fish, the amount of fish consumed, and the duration of exposure. The following information resources can be used in calculating intakes from surface water.

EPA Data Bases (see Section 3.1)
- GEMS
- LAMS
- STORET

Non-EPA Data Bases (see Section 3.2)
- ASFA
- MWDI
- WATERLINE
- WATERNET
- WATSTORE
- WDSD

Non-EPA Data Files and Tapes
- NASQAN
- WATSTORE

C.3.4 Combine Pathway-Specific Intakes To Yield Total Intake

In this step, the above calculations of intake from air, ground, and surface water are totaled to calculate an upper bound on the total exposure. Section 5.5 of the Superfund Public Health Evaluation Manual gives details on how this is accomplished. Information resources in the above three sections can be used to determine total exposure.

C.4 TOXICITY ASSESSMENT

The toxicity assessment is done to determine critical toxicity values in the Superfund health evaluation process. This information is used in conjunction with results of the exposure assessment to characterize risk. In the manual, reference doses (rfds), and evaluations by **EPA's** Carcinogen Assessment Group reported in *Health Effects Assessment Documents (HEAs)* are listed in Appendix C to serve as a consistent source of critical toxicity values. In situations where Appendix C does not contain the necessary data for all indicator chemicals at a site, the **EPA** Office of Environmental Criteria and Assessment (Cincinnati) should be contacted. In addition, the following information resources may be useful in conducting the toxicity assessment.

EPA Data Bases (see Section 3.1)
- CECATS
- CSDCLEANS
- CRIB
- DEEP
- EPACASR
- GI
- GTDMIS
- GEMS
- HEOX
- IRIS
- NATIONAL HUMAN ADIPOSE TISSUE DATA
- OHM-TADS
- ORALTOX
- PDMS
- PHRED
- SPHERE
- STARA

Non-EPA Data Bases (see Section 3.2)
- BIOSIS
- CBDS
- CCRIS
- CESARS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMANS TISSUES AND FLUIDS
- CHEMLINE
- CTCP
- EMBASE
- ENVIRONMENTAL FATE DATA BASES
- HSDB
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NPIRS
- OHS-MSDS
- PASCAL
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

C.5 RISK CHARACTERIZATION

In the risk characterization step of the *Manual*, a comparison is made between projected intakes and calculated risks in order to quantify the overall risk. Different types of risk characterization include:

- Carcinogenic Effects
- Non-carcinogenic Effects

The manual outlines different methods of characterizing risk for each type of effect.

C.5.1 Carcinogenic Effects

The carcinogenic risk is dependant upon the chronic daily intakes of the contaminant and the carcinogenic potency factor, values of which are listed in Appendix C of the manual. In addition, other information resources which may be useful in calculating carcinogenic effects are listed below.

EPA Data Bases (see Section 3.1)

- CARCINOGENICITY LITERATURE
- CECATS
- EPACASR
- GTDMIS
- IRIS
- SPHERE

Non-EPA Data Bases (see Section 3.2)

- BIOSIS
- CANCERLIT
- CBDS
- CESARS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CHEMLINE
- CIS
- CLEARINGHOUSE ON HEALTH INDEXES
- EMBASE
- ENVIRONMENTAL FATE DATA BASES
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NOES
- NOHS
- OCIS
- OHS-MSDS
- PASCAL
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

EPA Data Files and Tapes (see Section 4.1)

- CHIPS
- POTENTIAL SUBSTANTIAL RISKS

C.5.2 Non-carcinogenic Effects

The non-carcinogenic risk is dependent upon the exposure level, or intake,and the acceptable level of intake for the contaminant. For assessing teratogenic risk, the subchronic daily intake and the acceptable level of intake are often used. Reference doses are listed, for some chemicals, in Appendix C of the *Superfund Public Health Evaluation Manual.* In addition, the following information resources may also provide useful data.

EPA Data Bases (see Section 3.1)

- CECATS
- DEEP
- EPACASR
- GENERAL RADIATION HEALTH IMPACT EVALUATION
- GI
- GTDMIS
- HEOX
- WBC
- IRIS
- NEUROTOXICITY DATA
- OHM-TADS
- PERMDATA
- PDAS
- RAD
- SPHERE
- STARA

Non-EPA Data Bases (see Section 3.2)

- BIOSIS
- CESARS
- CCRIS
- CHEMICAL EXPOSURE
- CHEMICAL EXPOSURE: CHEMICALS IN HUMAN TISSUES AND FLUIDS
- CLEARINGHOUSE ON HEALTH INDEXES
- CTCP
- EMIC
- ENVIRONMENTAL FATE DATA BASES
- ETIC
- HAZARDLINE
- MEDLINE
- NIOSHTIC
- NOES
- NOHS
- NPIRS
- PASCAL
- OCIS
- OHS-MSDS
- PROFILE
- RTECS
- TOXICOLOGY DATA BANK
- TOXLINE

GLOSSARY AND DEFINITION OF ACRONYMS

Absorption:

The uptake of a chemical substance through a membrane by an organism. Absorption may be represented quantitatively sometimes as rate.

ACS:

American Chemical Society.

Acute/Subacute Toxicity:

Immediate or short term response of an organism to a single dose of a chemical substance through various routes of exposure. Refers to generalized toxic response with lethality usually being the observed endpoint. Includes LD_{50}, LC_{50}, LD_{Lo} and other quantitative endpoints.

Adsorption Coefficient:

This coefficient is a quantification of the adherence of a substance to a surface. The transport, degradation, and bioavailability of a substance are greatly affected by it's adsorption properties.

AQUIRE:

Aquatic Information Retrieval Data Base -- a component of SPHERE

Behavioral Toxicity:

Behavioral manifestations of an organism's response to a toxic substance.

Bioconcentration/Biomagnification:

The uptake and retention of a chemical substance in an organism or in organs or tissues of an organism (bioconcentration). An increase in the tissue concentration of organisms higher in the food chain (biomagnification).

Boiling Point:

The boiling point is the temperature at which a liquid under standard atmospheric pressure changes to the gaseous state.

CA Index Name:

This is a unique, fully systematic name assigned by the Chemical Abstracts Service (CAS). A CA Index Name may be made up of several parts, each playing a specific role in the identification of a substance. The CA Index Name is sometimes referred to as the CAS Preferred Name.

CAS:

Chemical Abstracts Service.

CAS Registry Number:

A number consisting of up to 9 digits is assigned by the Chemical Abstracts Service to represent only one chemical substance, insofar as that substance has been elucidated and defined. The CAS Registry Number is usually separated into 3 portions by hyphens. The first portion, starting from the left, has up to 6 digits, the second portion has 2 digits and the last portion consists of a single check digit which is used to validate the entire Registry Number.

CBI:

Confidential Business Information.

CDC:

Center for Disease Control.

CERCLA:

Comprehensive Environmental Response, Compensation, and Liability Act.

CHEMD:

Chemical Directory Data Base.

Chemical description/composition:

In certain substances, the CAS Index/Preferred Name may not be sufficiently detailed enough to identify the substance completely. The chemical description/composition name may be useful for those substances.

Chemical Incompatibility:

The capacity of a chemical substance to react with another substance to produce an undesired product.

CHIP:

Chemical Hazard Information Profile.

Chronic Toxicity:

Response of an organism to repeated, long term exposure to a chemical substance.

Color:

The aspects of a chemical substance that may be described in terms of hue, lightness, and saturation. Includes both qualitative and quantitative descriptions.

CPSC:

Consumer Product Safety Commission.

CSB:

U.S. EPA Chemical Screening

Decomposition Temperature:

The temperature at which heat causes the chemical degradation of a substance into two or more substances.

Density:

Density is the mass of a liquid, or gas per unit volume of that substance.

DERMAL:

A dermal exposure database -- a component of SPHERE

DIALOG:

A commercial vendor of on-line databases.

Dissociation Constant (K_a,K_b):

The dissociation constant represents the degree of ionization of acids and bases in solution. It is usually reported as the negative logarithm of the constant.

Distribution:

The internal transport and deposition of a chemical substance in body fluids, tissues, and organs. Distribution can be reported quantitatively.

DOE:

U.S. Department of Energy.

EEFIS:

Environmental Effects/Fate Information System.

ENVIROFATE:

Environmental fate database -- a component of SPHERE.

Environmental Characteristics:

These identify and characterize the medium that becomes contaminated, such as air, ground and surface water, or soil. This category would include such things as meteorological data (e.g., wind speed and direction), surface and ground-water characteristics (e.g., such as flow velocities), and soil types and characteristics.

EPACASR:

EPA Chemical Activity Status Report.

Epidemiology:

Study of the relationships of the various factors determining the frequency and distribution of diseases in a human community.

Excretion:

Elimination of a chemical substance or its metabolites by an organism. Excretion can be represented quantitatively and may include rate.

Extractability:

This refers to the extractability of a substance by water or other substances.

Eye Irritation:

Reactions produced in the eye after exposure to a chemical substance.

FDA:

U.S. Food and Drug Administration.

Field Studies:

An experiment in which organisms are exposed to a chemical substance in a natural habitat or in an artificial habitat that is located outside the laboratory and operated under natural conditions.

Flammable Limits:

Flammable limits denote the concentration range at which the flammable or explosive mixture will ignite and continue burning.

Flash Point:

The flash point is the temperature at which a liquid or volatile solid gives off vapor sufficient to form an ignitable mixture with air.

GEMS:

Graphical Exposure Modeling System.

GENETOX:

Genetic Toxicology System --a component of SPHERE.

GLOBAL:

An OTS indexing system of TSCA documents.

Henry's Law Constant:

The Henry's Law Constant expresses the effect pressure has on the solubility of a gas.

HERD:

U.S. EPA Health and Environmental Review Division.

Hydrolysis Rate:
The rate of reaction of a chemical substance with water to form a new substance or substances.

ISHOW:
Information System for Hazardous Organics in Water.

Melting Point:
The melting point is the temperature at which a substance changes from the solid to the liquid state.

Metabolism:
The physical or chemical alteration of a chemical substance by an organism.

Molecular Formula:
This number is a systematic summation of the actual numbers and kinds of options present in a molecule at a chemical substance.

Molecular Weight:
A summation of the individual atomic weights based on the numbers and kinds of atoms present in a molecule of a chemical substance.

Mutagenicity:
The capacity to cause an adverse effect on a genetic system.

NAS:
National Academy of Sciences.

NCI:
National Cancer Institute

NCP:
National Contingency Plan.

Neurotoxicity:
Observed effects to the nervous system caused by exposure to a chemical substance. Includes effects to neuromuscular transmissions and pathological changes in nerves, spinal cord, or brain.

NIH:
National Institutes of Health.

NIOSH:
National Institute for Occupational Safety and Health.

NOAA:
National Oceanographic and Atmospheric Administration.

NTIS:
National Technical Information Service.

Odor:
A description of the smell of a chemical.

OHEA:
U.S. EPA Office of Health and Environmental Assessment.

OHM-TADS:

Oil and Hazardous Materials - Technical Assistance Data System.

OHR:

U.S. EPA Office of Health Research.

Oncogenicity:

Tumor formation observed in organisms in response to exposure to a chemical substance. May include number, type, site, growth-rate and ability to metastasize of tumor.

OPP:

U.S. EPA Office of Pesticide Programs.

ORD:

U.S. EPA Office of Research and Development.

ORP:

U.S. EPA Office of Radiation Programs.

OSHA:

Occupational Safety and Health Administration.

OSW:

U.S. EPA Office of Solid Wastes.

OTS:

U.S. EPA Office of Toxic Substances.

Particle Size:

The average diameter of the individual particles in a particular solid.

Partition Coefficient (log P):

The n-octanol/water partition coefficient is the ratio of a substance's concentration in water-saturated octanol divided by it's concentration in octanol-saturated water at equilibrium. The partition coefficient provides an indication of a substance's ability to bioconcentrate in organisms and can also be used to calculate retardation factors of various contaminants in ground water.

PENTA:

An enhanced version of the Technical Data Indexing System (TDIS).

PHRED:

Public Health Risk Evaluation Data; a database.

PMN:

Premanufacturing Notification.

pH:

A value which represents the acidity or alkalinity of a solution. It is defined as the logarithm of the reciprocal of the hydrogen ion concentration.

Physical State:

Whether or not the substance is a gas, liquid, or a solid under ambient or other given conditions.

RCRA:

Resource Conservation and Recovery Act.

Reproductive Toxicity:

Observed effects on reproductive organs or reproductive performance of an organism. Includes egg laying, fertilization, number of offspring, and reproduction.

Relative Vapor Density:

Relative Vapor Density is the ratio of the weight of a gas to the weight of an equal quantity of air.

Route of Exposure:

The route of exposure is the mode by which humans or the environment is exposed to a chemical substance. For example, route of exposure may be dermal contact or inhalation, and route of environmental exposure may be air, water, or land.

RTECS:

Registry of Toxic Effects of Chemical Substances.

Sensitization:

A response of the immune system (an allergic reaction) of an organism caused by its being exposed to a chemical substance.

Skin Irritation:

Local inflammatory response of the skin observed after exposure to a chemical substance. Exposure can be a single, repeated, or prolonged contact.

Solubility:

The solubility of a substance in water (or other solvent) is the weight of the dissolved substance per volume of solution in water (or other solvent) when the solution is at equilibrium with an excess of the substance, i.e., saturated at a specific temperature. This definition is limited to homogeneous materials.

SPHERE:

Scientific Parameters in Health and the Environment; Retrieval and Estimation Databases.

Sublethal Toxicity:

Response of an organism exposed to a chemical substance that results in effects other than mortality, including; behavioral, reproductive, growth and physiological effects.

Sublimation Temperature:

The temperature at which the partial pressure of a vapor in equilibrium with a solid substance is equal to one atmosphere.

Synonyms:

The chemical synonym may be a non-systematic chemical name, a common name, a trade name, a class name, a code, or a trivial name.

TDIS:

Technical Data Indexing System.

Teratogenicity:

Abnormalities observed in offspring of females exposed in utero, and developmental delays, or fetal death.

Transport/Transformation Characteristics and Partitioning:

Partitioning refers to the relative distribution of a chemical among environmental media while transport refers to the potential movement of the chemical from one media compartment to another. Transformation refers to a chemical's change in structure. Major processes that effect transformation are photolysis, oxidation, hydrolysis, biotransformation, and the transport media characteristics.

TSCA:

Toxic Substances Control Act.

TSCATS:

Toxic Substances Control Act Test Submissions -- an indexing system.

USDA:

U.S. Department of Agriculture.

USGS:

U.S. Geological Survey.

Vapor pressure:

The vapor pressure of a substance is the pressure which a vapor, in a closed container and in equilibrium with its solid or liquid form, exerts on the enclosing walls.

Viscosity:

The internal resistance of a liquid substance to flow.

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